

FIRST AERO WEEKLY IN THE WORLD

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

No. 1302
Vol. XXV
No. 49

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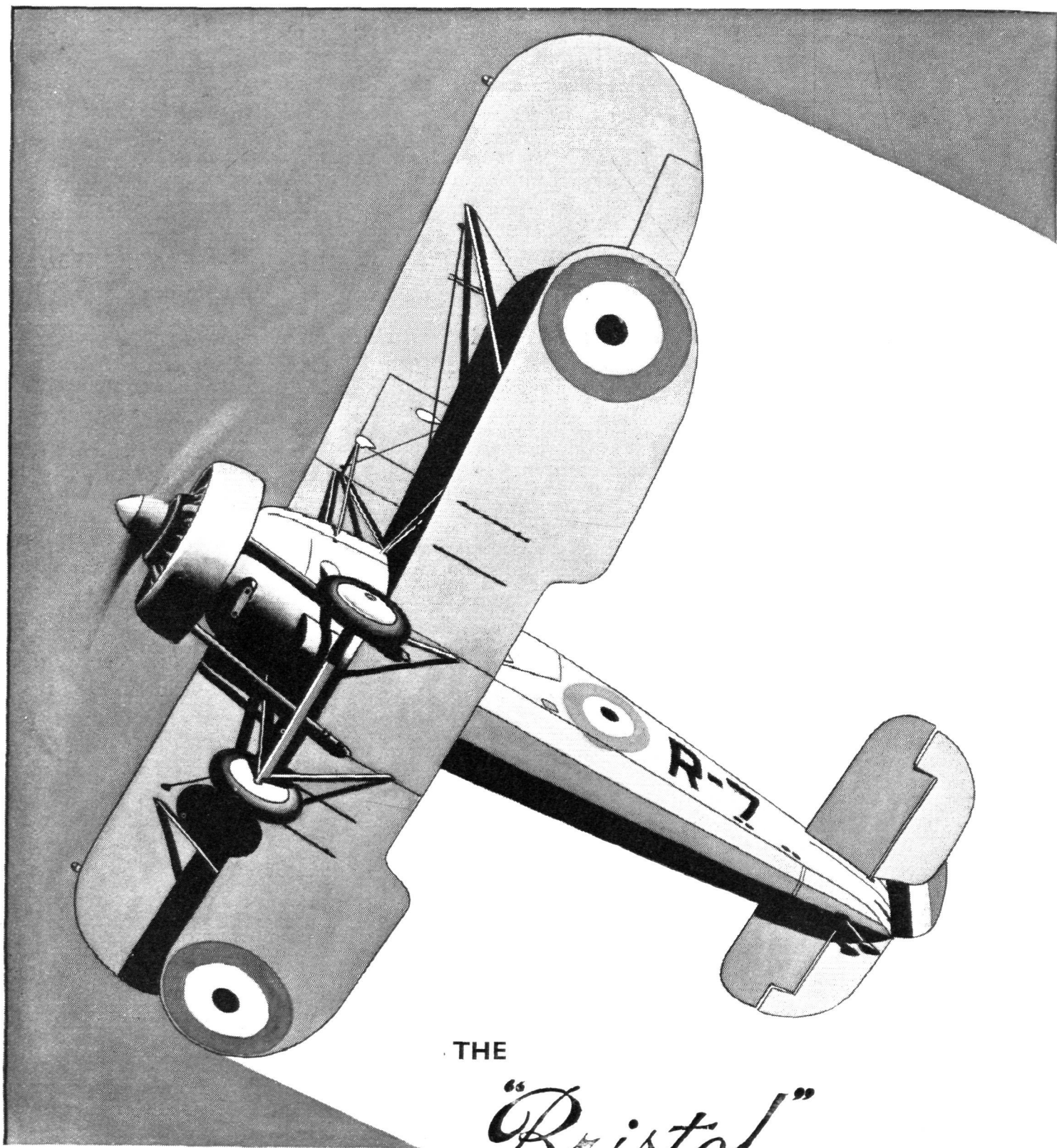
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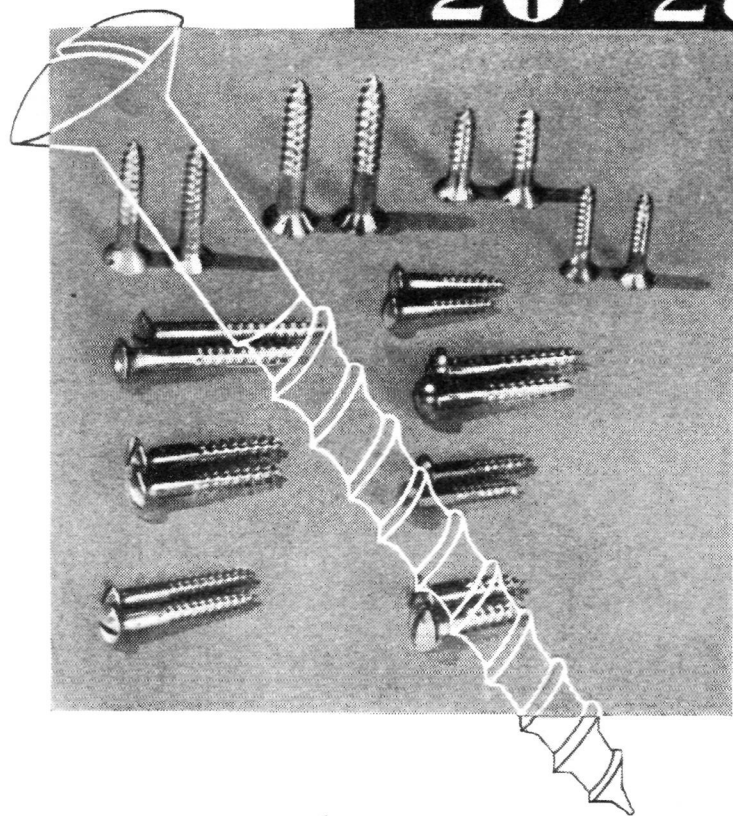
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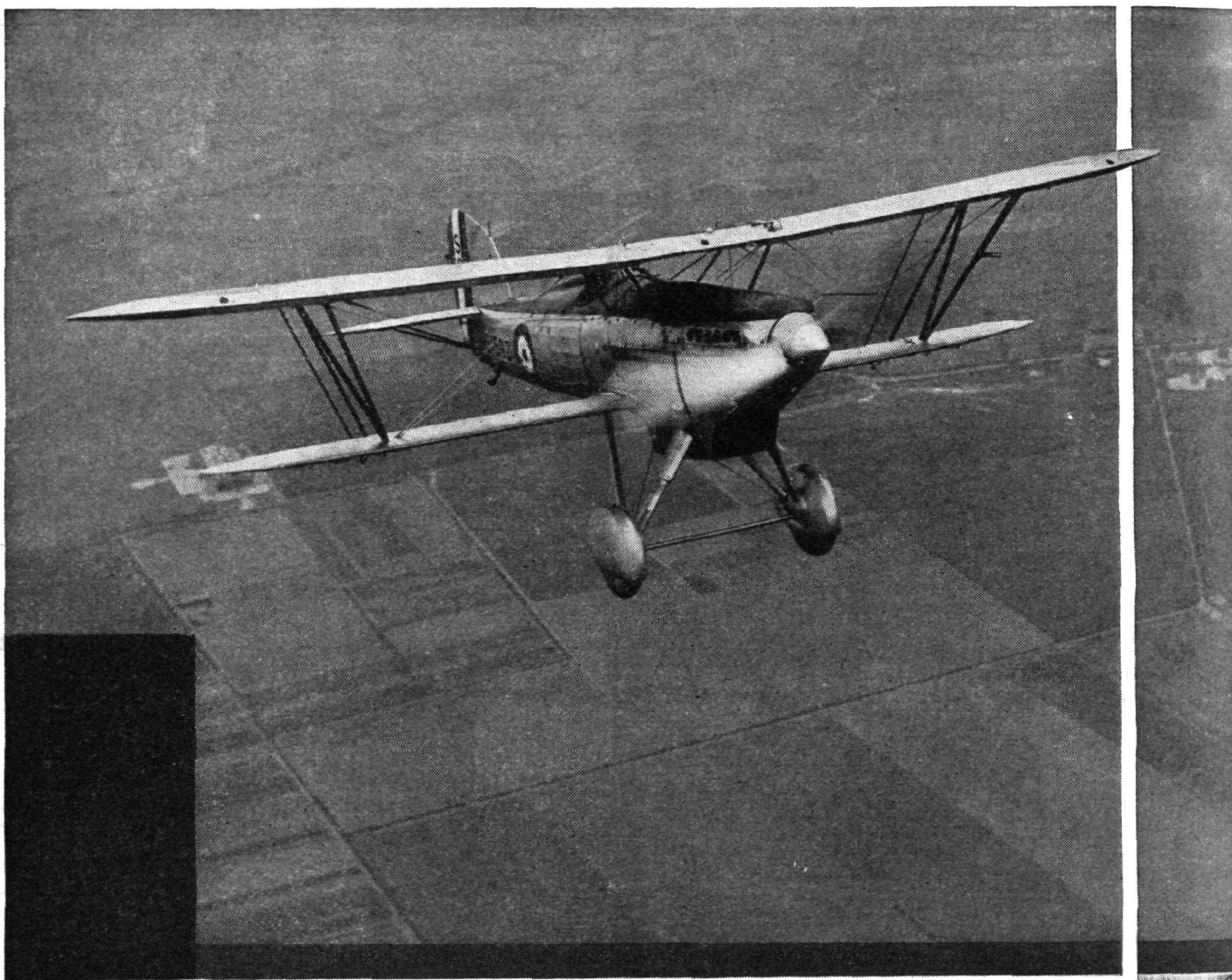
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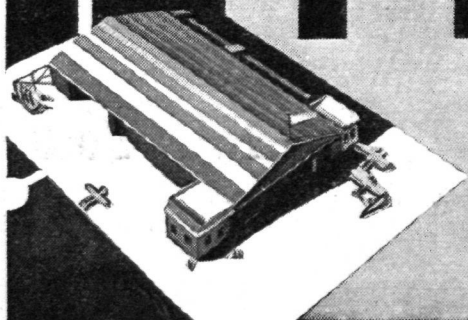
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The
AIRCRAFT ENGINEER
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Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport
OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 1302. (Vol. XXV.) 25th Year.
No. 49.

DECEMBER 7, 1933

Weekly, Price 6d.
Post Free, 7½d. Abroad, 8d.

Editorial Offices: 36, GREAT QUEEN STREET KINGSWAY, W.C.2
Telephone: (2 lines), Holborn 3211 and 1884.
Telegrams: Truditur, Westcent, London

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EDITORIAL COMMENT



NOT so very long ago it certainly seemed that internal air transport in this country had very little future. The British system of surface transport, by road and rail, is the best in the world, while the distances are short and the weather is of the worst, from the flying point of view. Here and there the map seemed to suggest a route where air transport would score, notably between Glasgow and Belfast, but early attempts to find a profit on that route were not too successful. Perhaps they were too early. It never pays to push air operations ahead of aeronautical developments. We find a striking example of that in the book about the Houston flights over Everest (which is reviewed on another page in this issue), where the organisers of the expedition state that it was only the development of the Bristol "Pegasus" engine which made the flights possible. Likewise, Imperial Airways' officials have said that they had no really commercial aeroplane until the Armstrong-Whitworth firm produced the "Argosy." Internal air transport will only become a profitable undertaking when the right types of aeroplane are developed and used.

Aeronautical science is now advancing to the stage where even the original doubters will have to recast their ideas about the possibilities of internal air transport in Great Britain. Machines can now be produced which will definitely show a profit on a suitable route if they can get full loads, while the airmindedness of the people is now such that full loads no longer seem a mere beautiful dream. The progress of late has been so rapid that we dare look ahead and prophesy with confidence that the qualities which we still lack will soon be in our possession. Fog is no longer the lion in the path which it was once believed to be. Instrument-flying is taught efficiently in many flying schools, and now the art of flying with confidence and safety through fog and darkness is not confined to a handful of experts at the Central Flying School. Before long wireless installations, even on small aeroplanes, may be as regular a fitting as are bumpers on the modern motor

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1933.
- Dec. 7. "Possible Future Development of Aircraft Engines." Lecture by A. H. R. Fedden before R.Ae.S.
- Dec. 8. Calshot Reunion Dinner, at R.A.F. Club, Piccadilly, W.1.
- Dec. 8. The Airports Conference, Mansion House
- Dec. 13. London Ae.C. Annual Dinner and Dance, Park Lane Hotel.
- Dec. 14. "Light Alloys for Aeronautical Purposes." Lecture by Dr. L. Aitchison before R.Ae.S.
- Dec. 15. Close of entries for International Touring Competition (1934), Poland.
- Dec. 18-24. International Rally at Cairo and Meeting of the F.A.I.
- Dec. 28. Irish Ae.C. Annual Dance, Gresham Hotel, Dublin.
- Dec. 29. Liverpool and Dis. Ae.C. Annual Ball, Grosvenor Hotel, Chester.
- 1934
- Jan. 11. "Testing of Aircraft Landing Mechanisms and Some Factors Affecting Design." Lecture by W. D. Douglas, before R.Ae.S.
- Jan. 18. "Ethyl," Lecture by F. R. Banks before R.Ae.S.
- Jan. 19. Newcastle-on-Tyne Ae.C. Annual Ball, Barras Bridge Assembly Rooms.
- Jan. 24. "Development of the Fleet Air Arm." Lecture by Wing Com. W. R. D. Acland before R.U.S.I.
- Feb. 1. "Engine Cowlings," lecture by J. D. North before R.Ae.S.
- Feb. 8. "Engines." Lecture by Capt. A. G. Forsyth before R.Ae.S.
- Feb. 16. Bristol and Wessex Ae.C. Annual Ball, Grand Spa Hotel, Clifton.
- Feb. 21. "Development of Aircraft and Its Influence on Air Operations." Lecture by Sq. Ldr. R. V. Goddard before R.U.S.I.

cars. Recent developments of the Autogiro may suggest the abolition of even the necessity for large landing grounds. At the same time, we must not forget that the railways have begun to enlist the help of air transport. The Bristol Channel has been found to be a case where it is better to send passengers across by air than to adopt any other expedient. Private enterprise has not hesitated to tackle the Solent and the river Humber, and if only an aeroplane could be produced which could carry a motor car cheaply for a short distance, there should be good hopes of profit in a ferry service across the Firth of Forth. We may come to that yet—who knows?—that is to say, providing the motor car contrives to survive the coming universal popularity of the aeroplane.

All aircraft, however, must deal with at least two elements, while amphibians deal with three. Flights must begin and end on either land or water. Since the flying clubs began to get active in Great Britain a lament has been going up to the heavens that the activities of the private pilot, even in fine weather, are circumscribed by the paucity of the landing grounds. Private flying is still only in its infancy, and it will increase rapidly in the next few years. Internal commercial flying is still in its cradle, but it too is beginning to show promise of healthy growth. Both of these children need aerodromes, or at least landing grounds, spread about the country. It is quite time that something constructive was done in this matter.

The most distinguished, and certainly one of the most enthusiastic, of our private owners is the Prince of Wales. It is common knowledge that he thoroughly enjoys flying, and it is an open secret that he is a good deal more than a novice at handling the joystick. With His Royal Highness enjoyment is always made the handmaid of business, and he uses the air for travel not so much because he likes it as because it saves his very valuable time, and allows him to get through more work than he could possibly do if he were to use older and slower means of travel. When, therefore, he opens the Airports Conference to-morrow at the Mansion House, and voices, as presumably he will do, the call for more aerodromes in Great Britain, he will speak with a personal knowledge of the subject, such as cannot be behind him in all the speeches which he makes in the course of a year. Of one thing everyone may always feel assured, and that is that His Royal Highness never gives his personal support to any movement without having the most careful inquiries made and having assured himself that the cause is a worthy one. Even if he were not a private owner of aircraft himself, his presence at the Conference would be a guarantee of its merits and its importance. The resolutions of such a Conference can be brushed aside by no one.

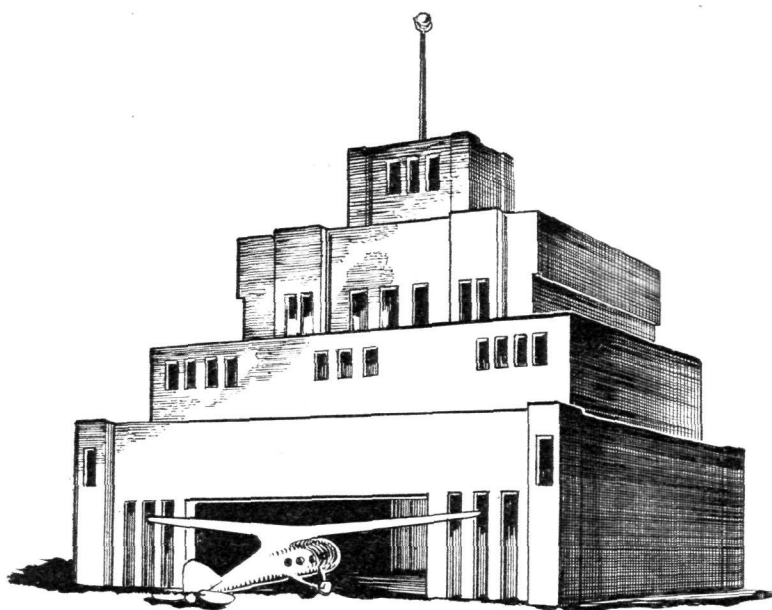
It is because of the unusual importance of this Conference that FLIGHT has decided to make the subject of airports the special feature of the present issue, and the articles which we publish from various contributors, all well qualified to speak on the subject, may clear away some of the undergrowth and help even the delegates to the Conference to get to grips straightway with the big trees. There was another Conference on airports held in London some

few years ago, in which there was much talking, but we venture to think that many delegates went home from it with no very clear ideas in their heads as to what would really be the best thing to do. Perhaps that Conference, like the Glasgow-Belfast air services, was somewhat before its time. Things have certainly altered in the meantime, and the situation is now very much more developed. Not only have aircraft been improved, and not only has the initial hesitation to fly largely died out, but of late an energetic house-building movement has laid its desirable, but not very beautiful, mark on the outskirts of most of our large towns and even of many of our villages. It is now very much more certain than it was four or five years ago that most towns of any size will really need airports, and it is also clear that if they do not take prompt steps they will be unable to reserve land for airports except at such a distance from the centre of the town that the speed of aircraft will be largely nullified by the time spent on ground travel.

Perhaps another reason why the earlier Conference did not effect much was that the ideas expressed at it were for the most part too ambitious. The idea seemed to be that every town ought to regard it as a duty to itself and to the country at large to set up a pretty fair imitation of Croydon. Naturally, even ambitious Mayors and Corporations shrank from spending the ratepayers' money to that extent, when the prospects of the town reaping concrete benefits from the possession of such an airport were so very nebulous. We are more modest and more business-like now. We do say that the future may well exceed our present expectations. The time may well come when elaborately-equipped airports will be a *sine qua non* of prosperity with any town of reasonable size. In those future days, perhaps, the proverbial Upper Puddington-on-Mud may regard the present equipment of Croydon as crudely mediæval. We must not forget such a possibility, and the measures taken now should provide for expansion if and when that should become necessary. But, as some of our contributors point out, for many towns the urgent need of the moment is only to secure a site, and to keep it clear of surrounding buildings. For others, it will be wise to level the landing ground and establish a petrol pump and a telephone. Others will very soon, or even now, find it advisable to set up comfortable waiting rooms for passengers and to see that adequate ground transport is available.

Airports may prove to be like Government railways in some parts of the Empire. They may, conceivably, never pay dividends themselves, and yet they may so develop the locality that to dispense with them would be ruin. The cities and towns must look ahead to the time when business men and pleasure-seekers will mainly travel by air, and must ask themselves whether it will pay them to attract such people to their city, and whether they can afford to see them pass it by. We know that many city fathers have already been scratching their heads over the problem of whether to secure an airport site or not. They are certainly not to be blamed for their hesitation, for hitherto guidance has not been easy to secure. We have no doubt that the matter will be made clear to them to-morrow at the Airports Conference at the Mansion House.

The Airports Conference



The Rt. Hon. Sir Philip Sassoon,
Under Secretary of State for Air,
sends us the following message:—

IT was formerly the fashion to say that there was no future for internal flying in Great Britain, because of the shortness of distances and the excellence of road and rail communications. Certain far-sighted people were not content with this view and the event is proving them right. It is now seen that there is plenty of room, even in these small islands, for air travel, and progress would be far speedier if only facilities for flying were greater.

We are suffering from a serious lack of aerodromes, and in particular of civil aerodromes conveniently situated to our great cities and large towns. Meanwhile, the rapid spread of building development on the outskirts of the very cities and towns which need air communications most is making the choice of suitable sites for municipal aerodromes yearly more and more difficult.

The situation calls for immediate action; not necessarily the immediate provision of fully equipped aerodromes, but the taking of the initial steps which will secure convenient sites for aerodromes before they are overrun by new houses.

Everyone, therefore, who has at heart the future of flying in this country, and the growth of the aircraft industry, must welcome the greater interest which is being taken to-day in the vital question of municipal aerodromes. I hope that The Airports Conference will meet with the success that it deserves. I hope further that it will result in a well-thought-out programme for the provision of internal air ports, to which the municipal authorities will do their very best to give speedy practical effect. In this matter, it is essential that we should look well ahead and try to visualise, and to provide for while there is yet time, the great increase in public and private internal flying which is already on its way.

Philip Sassoon

HIS ROYAL HIGHNESS THE PRINCE OF WALES has always shown a keen appreciation of the need for fostering a widely-spread and soundly-built Empire Air System.

His own use of air travel has been extensive, and for that alone we should be grateful to him. That debt of gratitude will be even larger when, on December 8, he opens, at the Mansion House, the Airports Conference, which has been convened by the London Chamber of Commerce and the Royal Aeronautical Society. At this conference all sides of the municipal airport question will be discussed, and papers will be read which will be full of information for the many municipal authorities attending. Among those who are speaking are Lord Londonderry, Secretary of State for Air, and Sir Hilton Young, Minister of Health.

We imagine that the theme of all speakers will be the need for action. We must have municipal aerodromes available for use at all important towns and cities laid down now. The matter cannot wait. All towns and

cities are growing, and unless action is taken in the near future it will become impossible to find an area of adequate size, sufficiently near the centre of those towns, to be of any use. The whole matter is a vicious circle. We, in this country, have got the fastest ground transport in the world. Therefore, if it is to be of any use, air transport must also be the fastest. But that speed is of no use at all if the terminal aerodromes are so far from the towns that the passenger has to spend time in travelling on the ground after he has left the aeroplane. Therefore, to make proper use of air transport, it is necessary not only to have large landing areas which can be used by fast aeroplanes, but those landing grounds must be close to the towns.

In far too many cases, the matter has been left so late that already there is great difficulty in finding suitable sites. We have only sixteen Municipal Airports as yet, and another five towns have purchased sites. These are absurdly small figures, taken in comparison with the number of towns in the British Isles having large

populations. If this state of affairs is allowed to continue, it will lead, before long, to a parallel with what happened in many cases, when our network of railway lines was laid over the country. Then, many towns refused to allow the railway companies to run lines close to the town; to-day those towns regret, most bitterly, that they are "off the map," and that commerce passes them by. Towns which do not look ahead and establish well-placed aerodromes will just as surely be passed by, because already keen-minded business men are using air transport. They find that this modern and fast method enables them to pay visits to towns far distant and yet still be able to get back to their own office and see to their correspondence before closing time in the evening. Had there not been an airport at the town they wished to visit, that town would as likely as not have lost that business.

It is a municipality's duty to its own business men to establish an airport, and it is on these considerations that we urge them to do so as soon as they can. They should not, as they may have previously been tempted to do, say to themselves, "Let's have an airport so that we can make some money out of it." No! their aim should be a long-sighted one which will best serve the business interests upon which their prosperity depends. But, let it not be thought that it is only commercial towns which need consider this vital matter. Business men need relaxation and pleasure. As time goes on, everything will move faster, and so the time a busy man wants to spend on travel will be less. That will apply just as much to travel for purposes of pleasure as for business, and for that reason watering places, spas, seaside resorts and so forth, will also find themselves "off the map" unless they have their own airport. Put briefly, no town can afford to be without a place where those who travel by air can land.

Having, we hope, shown that it is necessary to have an airport, the question arises as to what an airport is, and for that reason we have secured a series of articles, written by experts, which will explain the why and where-

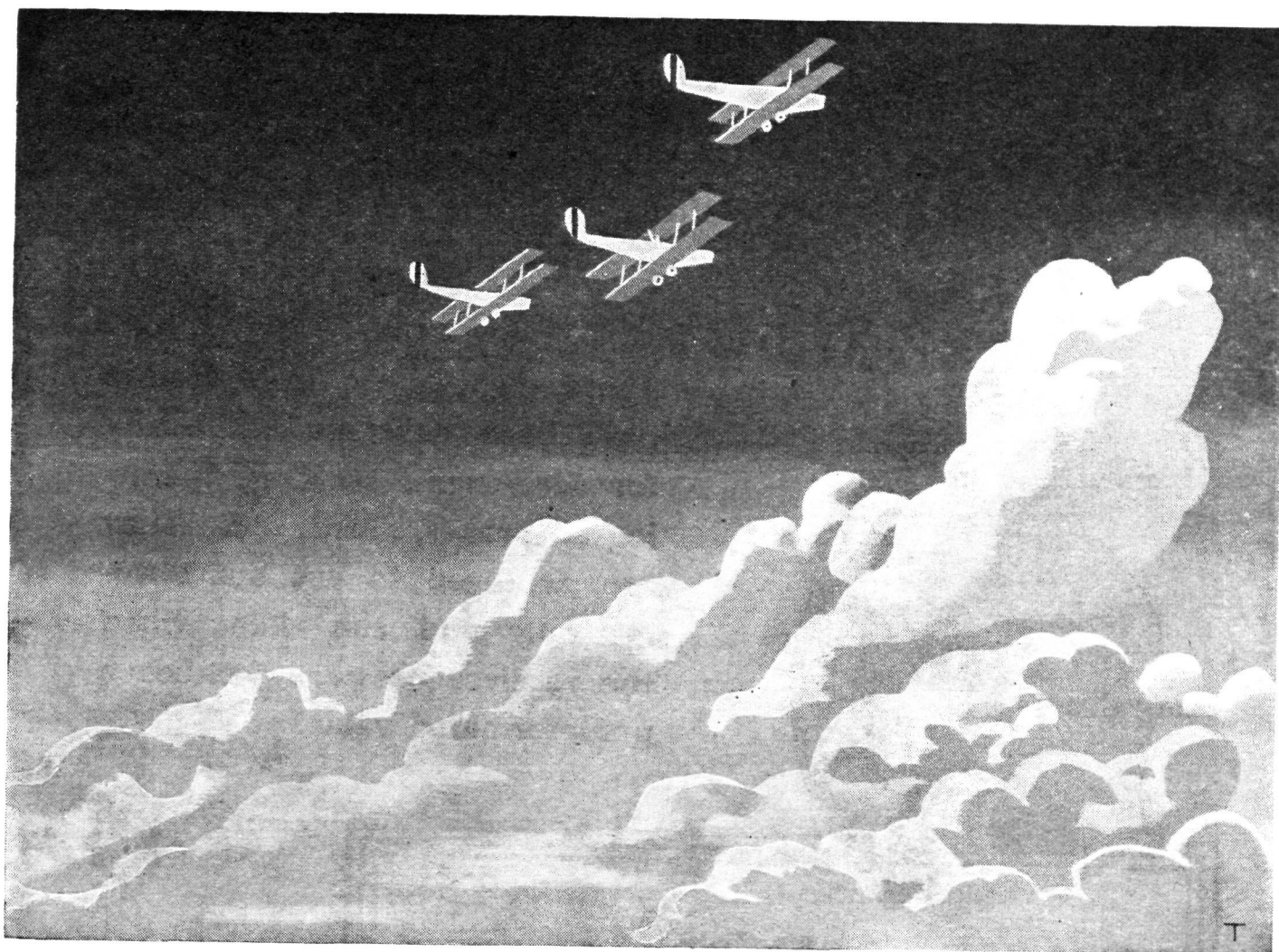
fore of airports in a clear and logical manner. Here it will suffice to say that our view is that securing an adequate area of ground correctly situated is the most important point. There is no need, at this stage, to incur heavy expenditure upon elaborate building schemes which may have to be altered in the future. A landing ground capable of extension, so that there will be no difficulty for the fast machines when the speeds rise as they are bound to do, is the immediate necessity. The rest can grow on lines which will be indicated as the traffic itself grows. Our special articles will give readers a clear idea of what equipment is necessary, and our advertising pages will tell them where to get that equipment.

In conclusion we must refer to the existing system of aerodrome licensing.

It has long been realised that the existing scheme of licensing and registering aerodromes has many serious difficulties. We are now able to announce that a classification scheme which will simplify the whole matter is at present under consideration by the Air Ministry. It is not yet possible to publish full details, but, briefly, it may be said that there will be definite minimum requirements which will have to be complied with before an aerodrome can be licensed, which is required by the Regulations, but placed on top of that will be a voluntary scheme of classification which system will always be considered in relation to the fullest amount of information which can be conveyed to a pilot by a system of indexing. The three main headings under this classification, or index, system will immediately indicate to a pilot the minimum dimensions of an aerodrome in all directions, the facilities for aircraft and personnel by day, and, thirdly, facilities for aircraft by night. This classification system will be applied only to permanent aerodromes. There will still remain the private use and public use aerodrome, and there will also be the temporary landing ground licensed for such purposes as "joy-riding." The index figures and letters for an aerodrome will not be placed on the aerodrome by means of



NORWICH : Norwich Airport as will be seen from this magnificent photograph taken by the Norfolk and Norwich Aero Club, lies very close to the City. In the bottom right-hand corner are the works of Boulton & Paul, Ltd., the well-known aircraft manufacturers. The river Wensum shows up clearly in the city's centre.



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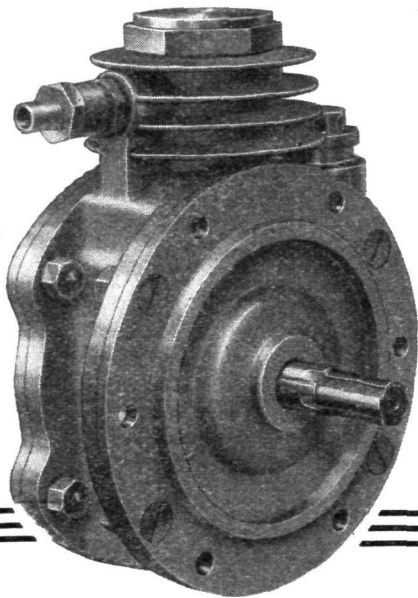
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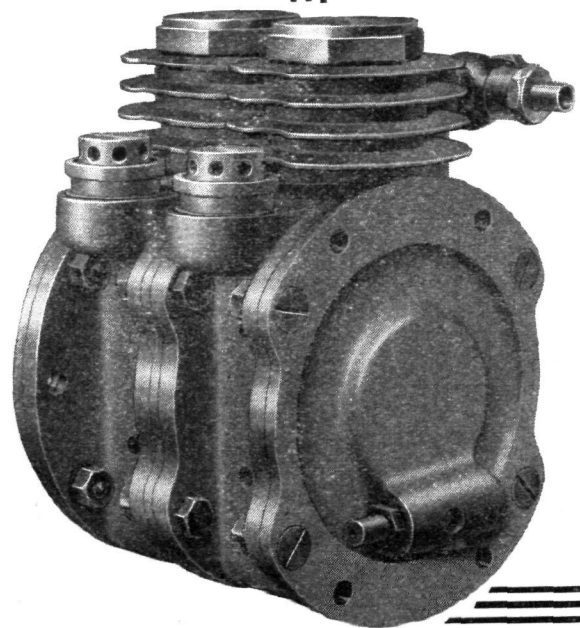
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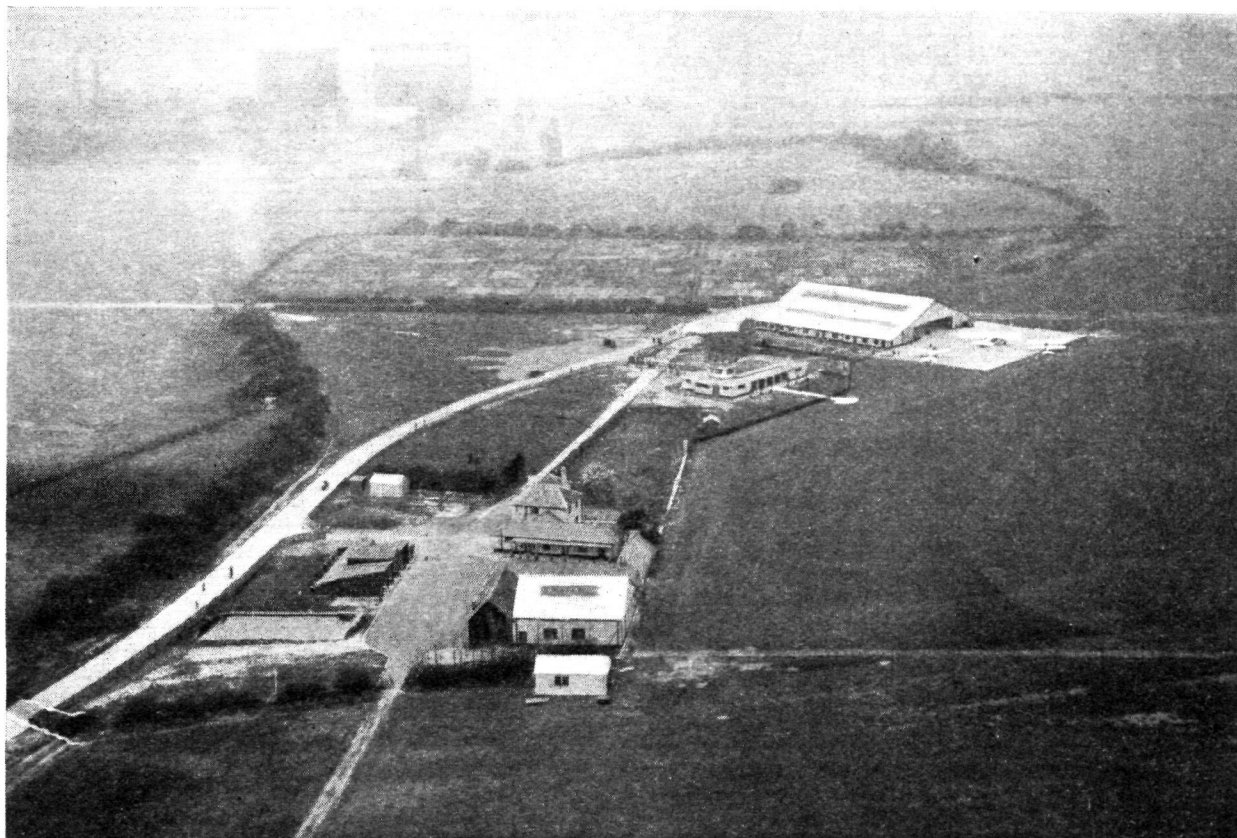
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PORTSMOUTH : In the foreground is the old farmhouse which has been converted to serve as the clubhouse for the Portsmouth Aero Club. Between it and the hangar can be seen the restaurant and control tower. The large hangar holds the machines of the Portsmouth, Southsea & Isle of Wight Aviation Co. (FLIGHT Photo.)

any form of ground marking, but it may be that a supplementary list to the very full information in the "Air Pilot" will be compiled, which will, at a quick glance, enable any pilot to know which aerodrome is suitable for his machine. The advantage of the scheme is that, not only is it hoped it will be informative from the pilot's point of view, but also will set a hall-mark not only on those existing aerodromes which come into the highest category, but will give something for the smaller and younger aerodromes to aim at for the future. For example, there are municipalities or other authorities whose finance does not, at the moment, warrant the provision of a complete and fully equipped airport, but who realise, as we hope every municipal authority in this country will

soon realise, that it is obviously essential to the welfare of their municipalities that they should establish an adequate landing ground in the very near future. In this case the landing ground would receive, provided it conformed to certain minimum requirements, the lowest classification. Then as traffic grew, and as the Town Council or Airport Committee began to see it had done the right thing, they would vote a little more money and obtain a slightly better classification. This would bring in its train further business and make their town a still more important one, and so on until in the end they could obtain the highest classification of A1a, or whatever it might be. It is difficult to find any snags in a scheme of this nature, and it is hoped that it will be instituted in the very near future.

FAITH!

By IVOR McCLURE

IN Aviation, as in Religion, faith plays a very important part. Those who have believed in the future of flying have tried to spread the gospel among the incurious. It has been hard work, because, as in most religions, arguments cannot be supported by statistics or balance sheets, and these carry weight with business men. Evangelists, religious and aeronautical, are alike hampered because their audiences realise that if once they believe, it will probably cost them something.

If only local authorities would believe in flying! In a country with over two million motor-cars we have been able to point to a thousand British aeroplanes, of which 500 are privately owned. Until this year, one British air line crossed a small corner of England. In terms of transport this would not cut an ice cube. Yet sixteen cities and towns have believed in aviation, and it has cost them nearly half a million pounds.

As there are over fifty more towns to be converted before even the principal centres in these islands can be connected by air, it is worth inquiring whether the first sixteen were wise or foolish virgins.

By buying aerodromes, have those sixteen cities and towns started anything? Glasgow, Blackpool, Liverpool,

Cardiff, Bristol, Plymouth, Portsmouth, Hull and Inverness have all been termini or points of call on regular scheduled air services for the first time this year. Most of these air lines competed with ferry steamers, not railway trains, and no one made a fortune. Nevertheless everything has to have a beginning, and it is no wild statement to say that had there been more municipal aerodromes there would have been more services, even if no more dividends. Present developments, therefore, show that something is happening as the result of municipal enterprise. When things move at all these days they move quickly.

The next inquiry is of the future, and although faith has once more to be invoked, we can adduce present-day world practice as an indication of what may happen tomorrow in Great Britain.

The most important development of the future is flying with regularity. This can be done now both by day and by night when the weather is fair. In future it will also have to be done when the pilot cannot see. The radio beacon tells the pilot by means of an indicator on the dashboard whether he is flying on the right course or not. With this instrument he can fly in cloud or fog and not have to see the ground. Beacons of this kind exist in

IPSWICH : Ipswich Aerodrome lies in open country and would be an ideal place for manufacturers who like fresh air. (FLIGHT Photo.)

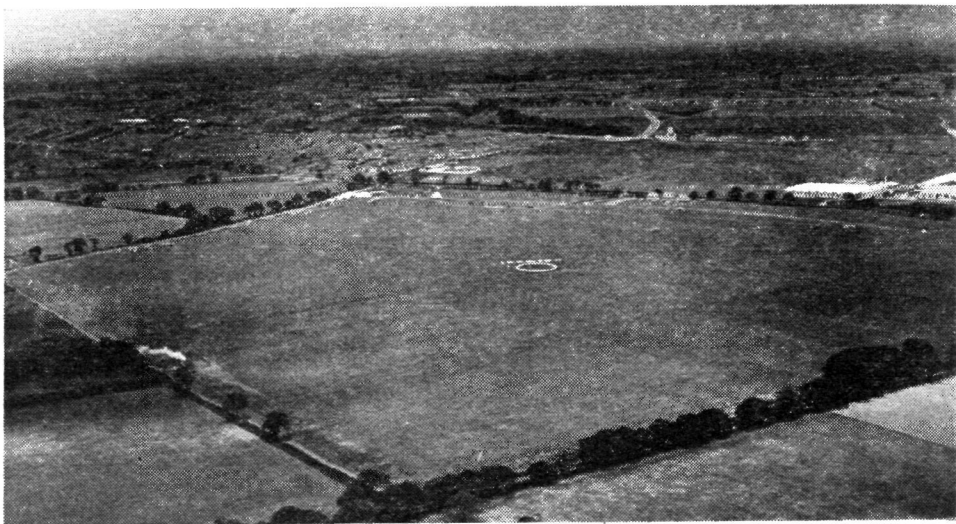
America and also in Europe. When flying blind along his route the air line pilot can learn his position from time to time by listening to marker beacons. These tell him when he passes over certain points. This practice is also followed in America. In addition to both these aids to navigation, wireless communication between the pilot and traffic control officers is essential. On all regular international air routes this has been provided.

There only remains to be perfected a system by which a pilot is enabled to land an aeroplane when he cannot see even a few yards. The departure in thick fog is already possible. The problem of landing when visibility is nil is being studied in America, England, France and Germany. That it should not be solved is incredible. When such air route equipment is used there should be no weather conditions in these islands that could make flying impossible. Regularity can be achieved.

The next important problem is speed. British aeroplanes in common use cruise at a little over 100 miles per hour. At present this disadvantage is offset by the fact that these aeroplanes can land and depart from small aerodromes and fields. As we have so few big aerodromes, this is very important. When we have sufficient aerodromes we can have greater speeds. What is equally important is to improve the accessibility of aerodromes. Unless this is done, a vast volume of relatively short-distance traffic will be lost to the air.

Flying in England is fairly cheap, but if aeroplanes were very much faster the time saved would justify higher fares. Aeroplane constructors on the Continent are aiming at cruising at 150 miles an hour. In America they are claiming nearly 200 miles per hour. If we take the latter figure as something that we could achieve if we tried, then flying would look a better commercial proposition than it does at present.

On the often quoted journey from London to Belfast, the air could save ten hours, allowing an hour to get to and from the aerodromes. But there are far more people interested in shorter journeys, and at first sight the saving of time on these is not so apparent. A glove manufacturer in Worcester saves only $2\frac{1}{2}$ hours on a journey to Manchester. His rival in Yeovil saves $4\frac{1}{2}$ hours on a journey to Leeds. Would a man pay much more for his ticket to save only that amount of time? A man makes



a journey of $1\frac{1}{2}$ hours more readily than one that takes over four hours. It is a very much better business proposition for the Yeovil man if he can go to Leeds and back in six hours instead of wasting thirteen in the train. The relatively small saving of time that the aeroplane can effect over short distances should nevertheless be sufficient to encourage business men to undertake journeys that otherwise they would hesitate to make. If this is true, there is a very big traffic to be carried by air in these islands.

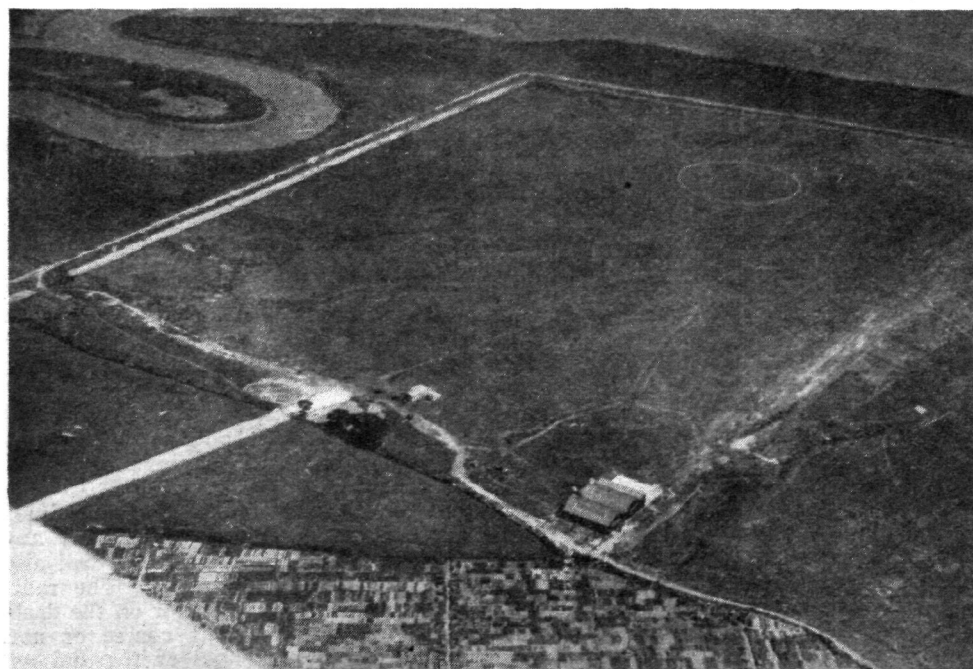
Then there is the question of frequency. From the point of view of economical operation it must be decided whether it is cheaper to operate large units infrequently or small units often. From the point of view of the user, a service every hour or half-hour is the more attractive, as then he does not have to worry about time-tables. A departure every hour on the hour on one American air line has attracted many more passengers than used the former infrequent service.

Stopping places along the route must detract a great deal from the aeroplane's one advantage—speed. A landing and a departure cannot well take less than a quarter of an hour. Three landings would add the equivalent of 150 miles to air journey. A few aeroplanes stopping often could link up a number of places by air, but the saving of time between termini would be much reduced. If the stops are few, there will have to be more services and more aeroplanes. Such considerations imply busy airports. A large number of regular services with fast aeroplanes arriving and departing at short intervals in all weathers by day and by night should please anyone who wants business to prosper.

The officers controlling the air routes and the aerodromes will have some nice problems. Because the changes in weather are swift and frequent, the airway rules will

have to be based on the worst conditions that can obtain. An air route must have air lanes at heights A, B, C, D, and so on. A may start at 1,500 feet, the air below being free for casual traffic not under strict control. Route 6, for instance, may have air lanes B, D and F, as it has to cross Route 10, which has lanes A, C and E. To the right of each route there may be descending lanes so that an aircraft on lane F may glide down without crossing the lanes below it. Round each aerodrome there must be a controlled circuit area for arriving and departing aeroplanes.

In addition to the regular air liners, private machines flying on business or for pleasure must be accommodated on the routes subject to the aircraft having suitable equipment and the pilots have the



CARDIFF : Cardiff Airport at Pen-gam Moors is on level ground close to the river.

necessary certificates. The controlled aerodrome will be open, therefore, only to controlled traffic. The free aeroplane, one that leaves and arrives when it wants and flies in the free zone under the air lanes, must be relegated to free aerodromes. That means at least two aerodromes for every place of any importance. At a large town it seems doubtful if it will be possible for all the controlled traffic to be accommodated at one airport. In conditions of bad visibility it might be difficult to clear more than six aircraft in and six aircraft out in an hour—one every five minutes. With several air lines radiating from a town

and special traffic requiring accommodation on the air routes, more than one airport may be necessary if delays are to be avoided. By the time a third airport is required at any place the problem of the in-town aerodrome may have been solved.

If only local authorities will have faith and move mountains (if necessary) to make aerodromes, some of this may come about. If they do not, it probably will not, and it would have been far better for a lot of us to have taken an interest in greengrocery instead of in aviation. After all, if the nation is going to vegetate . . .

REQUIREMENTS FOR THE AERODROME OF TO-DAY AND OF TO-MORROW

By MAJOR R. H. S. MEALING

(Major Mealing, who is Chief Technical Assistant in the Directorate of Civil Aviation, answers in this article many of the questions which have been put to him by those who, in considering the establishment of an aerodrome, hesitate to involve themselves too far for fear that future requirements might nullify any expenditure now incurred.)

IMMEDIATELY one considers the establishment of an aerodrome to-day it is but reasonable (perhaps one should add proper) that one should, without trying to delve too far into the future, say to oneself, is this the kind of aerodrome which will be required to-morrow? There may or may not be many modifications to the present-day aeroplane; it may be able to ascend from and land on a tennis court—that is the usual belief—but there is a distinct possibility that aerodromes will have to become larger before they can become smaller.

As with any large engineering project built to last, the ideal way to establish an aerodrome is to plan for the future but build only for to-day. Therefore, one should try to visualise the requirements for an aerodrome of the future before one draws up any plans for to-day. But where, as in this country, aerodromes are so badly needed, one must, I think, first of all plan for to-day, but not forget the future. There may be only a small difference, but I think there is nevertheless a distinct difference in these two methods. I will, therefore, take them in that order:—

(a) "Requirements for the aerodrome of to-day" (which can be based on fact); and

(b) "Requirements for the aerodrome of the future" (which can be better based on fancy, but cannot be more than an intelligent anticipation by one in constant touch with all developments).

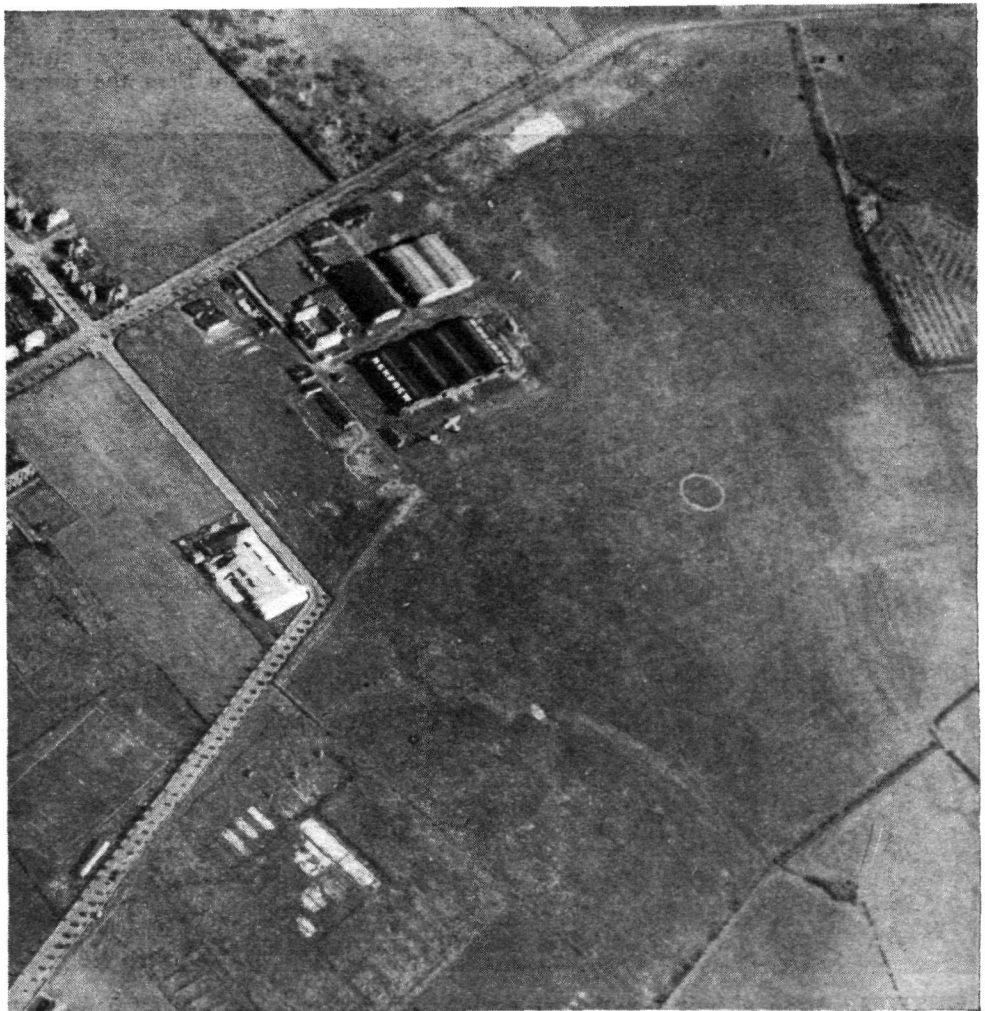
In what one might term the "olden times" of aviation any one concerned with finding an aerodrome, if he was successful, found one literally; by this I mean that he looked for a few flat fields and by a very small amount of tree felling, hedge removing, etc., he had a ready-made aerodrome. The location of the site was purely a matter of secondary importance. And I would like to add that far too many people are still suffering from that complex

One cannot help but feel sometimes that the existence or even the site of any old landing ground—war-time or otherwise—is a hindrance rather than a help.

There is an unfortunate tendency, particularly for the inexperienced, to think—"once an aerodrome, always an aerodrome"—quite regardless of the fact that the usefulness of an aerodrome in the past bears practically no relation to the usefulness of the aerodrome, and particularly of the municipal aerodrome, of to-day.

The manner in which one should set about choosing a site for a municipal aerodrome is not so much to consider just what sites are possible and available, but to say, and say most emphatically, to oneself (having regard to all the requirements for an aerodrome and the manner in which air transport is going to serve one's town), which is the best district for our aerodrome? And not till the problem of the best district is settled should one begin to consider the "pros and cons" of possible and available sites.

The best district has to be considered in relation to (a) meteorological conditions, (b) access to the town or district which it is to serve, and (c) bear some relation to the future possible air routes which may serve that town. It should neither be so high as to approach the average cloud base nor be so low as to be subject to fog. It is nearly always possible to strike the happy medium. One must,



RENFREW: Renfrew's aerodrome possesses the advantage of large ex-R.A.F. hangars.

however, emphasise the point that from the meteorological point of view each place must be considered on its merits. I well remember that not more than three years ago I was asked to inspect a site for what is now a well-known municipal aerodrome. I was exceedingly dubious about approving it, because by all the normal laws of meteorology it should have been excessively subject to fog. I was assured that it was not, but still felt it necessary to have a careful examination carried out by a meteorological expert, with the result that it was found that, due to a special set of conditions, this particular place was almost exceptionally free from fog.

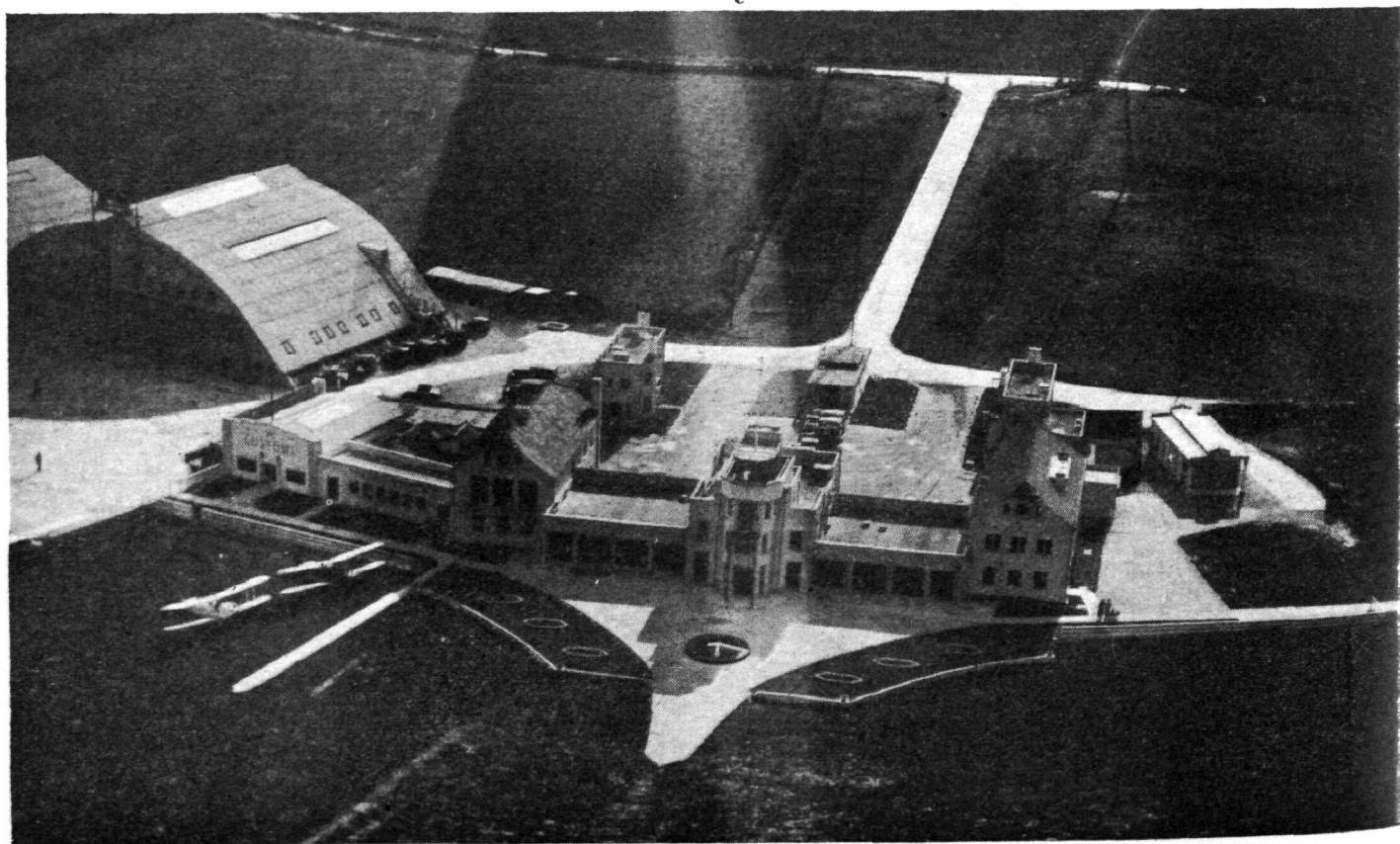
It is very necessary to have a place properly considered from the meteorological point of view by an expert. It is most dangerous to accept local opinion. Just as so many people remember only when the weather forecast is wrong and forget the large percentage of times that it is right, so is it possible to be misled regarding meteorological conditions without having proper data to rely on. It is most necessary that any aerodrome should have good access to the town which it is to serve, and although too much emphasis should not be laid on the importance of choosing a site because it is accessible, one must bear in mind the necessity for making it accessible. It may not be possible to forecast air routes to and from any particular aerodrome, but if it is, some regard might be paid to the advisability of avoiding any particular air route having to cross the town at a low altitude. It will be obvious that it is a bad thing to choose a site which is surrounded or even bordered by any high and dangerous obstructions which an aeroplane, when taking off, cannot normally clear without turning. Such obstructions might be a number of tall chimneys, overhead electric cables, a hill surmounted by trees, and many others. These might be termed direct obstructions, but there are such things as indirect obstructions which in themselves are not dangerous to an aeroplane, but whose influence is certainly so. The most usual forms of obstructions coming under this heading are hills, certain formations of trees, etc., which either by their formation or nature can cause serious down draughts at the time they are least expected. Such effects can be intelligently anticipated, but should be confirmed by test. Perhaps the next step is to find a site which can be drained, which can be reasonably well levelled and one whose dimensions are adequate for to-day and which will be adequate to-morrow.

This is where one comes to an oft-quoted question whose effect is, "why should the Air Ministry say they will not

licence anything whose dimensions are less than 600 yards in all directions, and even ask for more, when the whole tendency for modern aircraft is to land on a tennis court?" With all the respect in the world to the great advance which has been made by various types of aircraft, which in the last few years have displayed their ability to land within a very small area, one cannot possibly say that their design is universal or even accepted. Therefore, one must legislate for what might be termed the present-day normal type of aircraft, and having regard to the daily increasing demand for higher speeds, these faster machines may quite possibly, due to certain factors in their design, require a larger area for the purpose of landing and taking off. One must not, therefore, ignore the possibility of aerodromes of the future having to be larger rather than smaller.

Whatever the tendency might be in respect of aircraft design of the future, one must remember the necessity for allowing for sufficient room for a reasonably large number of aircraft to manoeuvre and to be parked (temporarily or otherwise), and, therefore, taking all things into consideration, one can safely say that it will be some time before it is possible to make the present-day requirements regarding dimensions less than they are at present. One might summarise the present-day requirements for an aerodrome by saying that it must be correctly located, must be capable of being drained and levelled, should be reasonably clear of obstructions, and must be large enough.

Once having chosen a site, it is most unusual to find that one cannot devise some reasonable plan for laying it out, but one should not allow any difficulty in laying it out to counteract one's selection of the best site. Having chosen the site, one can, therefore, proceed to consider ways and means for laying it out. Many people are perturbed by the apparent expense entailed in establishing buildings. If one is going to be perturbed by such an expense, it is better not to consider any buildings at all. But one must remember the bare necessities of the modern "man and his beast." "Man" may have business to conduct, friends to see, perhaps is hungry and thirsty, and if such things cannot be attended to on the aerodrome, he requires a means of conveyance. This means that a telephone is necessary—but not more. The modern beast requires the modern equivalent of fodder—namely, fuel and oil. That naturally must be obtainable on the aerodrome, as the aeroplane cannot go farther to it. But it is not at all necessary in the early stages to provide more than the bare minimum necessities, which must, of



HESTON : Although not a municipal airport, this busy terminus of much Continental air traffic, is one of the best equipped in the country. Our view shows the excellently laid out buildings. (FLIGHT Photo.)

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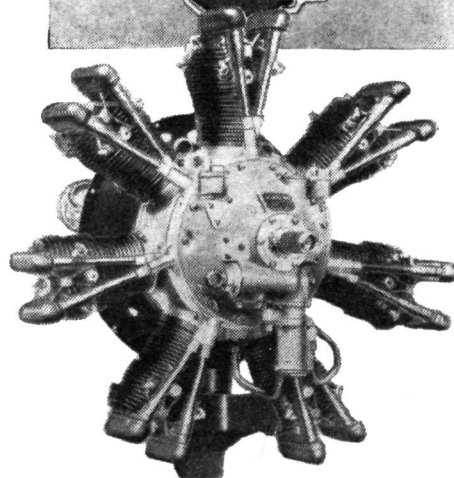


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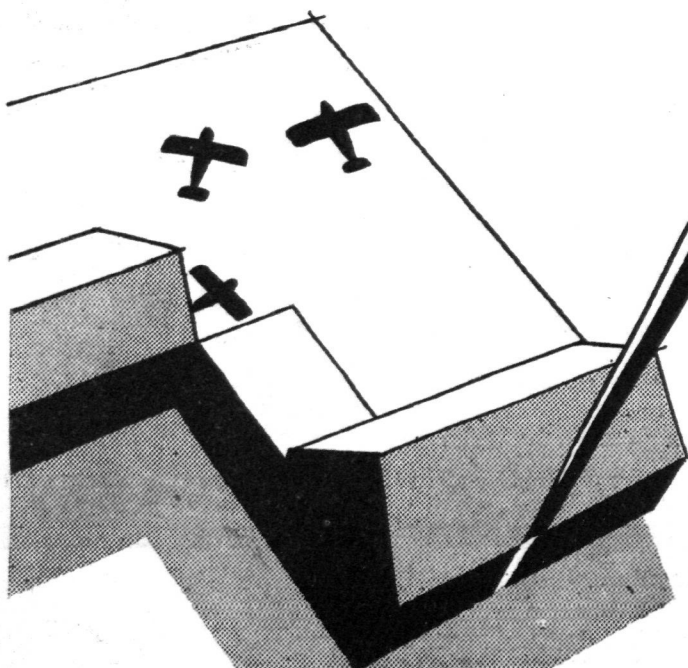
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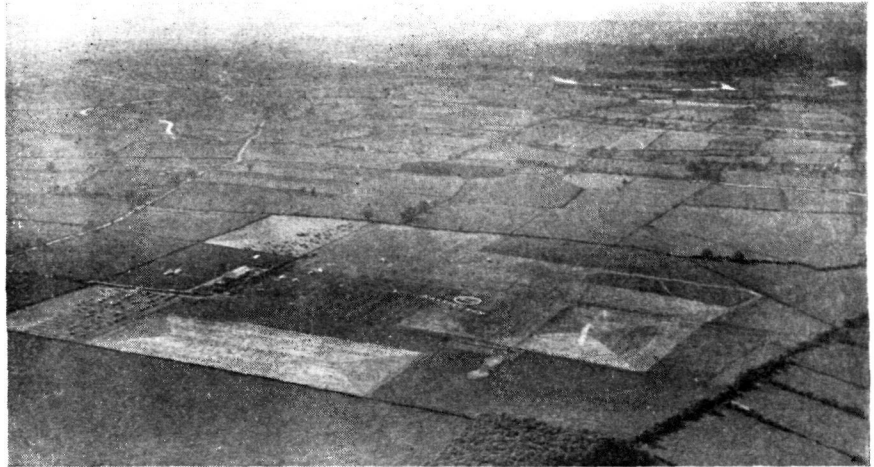
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NOTTINGHAM: Nottingham Aerodrome at Tollerton is a large open one, which is also used by the Nottingham Flying Club. (FLIGHT Photo.)



course, include a wind indicator, which is a very small item. When the growth of traffic demands, and not till then, is it necessary to consider the provision of hangars for aircraft, offices and waiting rooms, restaurants, etc., for passengers. In other words, select your site, prepare as much of it as is necessary for to-day and do not consider providing expensive buildings until they are justified. So much for to-day! What does the future hold for us?

Large towns will certainly require more than one aerodrome, which will perhaps be on the outskirts of the town, but, looking still further ahead, there is no doubt that some form of central aerodrome will be required within the town itself. This latter may take the form of a surface aerodrome if any town is fortunate enough to have available, or is able to make available, a sufficiently large area. Failing being able to do that, and provided it is an engineering and financial possibility, one can confidently anticipate the coming of the overhead aerodrome. It may be necessary to design special aircraft to operate from such overhead aerodromes and to have specially trained and skilled pilots.

It seems probable that the first type of aircraft to use the overhead aerodrome will be the air taxi of the future—possibly the type which have already proved their capability to alight on and take off from small areas. These air taxis would be the connecting link with the aerodrome outside the town from which the large and fast air liner

of the future will operate. No design for an overhead aerodrome has yet been approved, but that should not deter authorities from at least thinking of them when preparing town planning schemes, and particularly their central areas, in the days to come. What is most necessary is for authorities to consider doing something *to-day*, either in the way of establishing a landing ground or at least of reserving the site for one, but whilst providing only for what is required to-day, always drawing up one's plans so that the aerodrome progresses as air transport progresses. And let it not be forgotten that one is not talking of the future, but of *to-day*; when one says that air transport in Great Britain is being held back by lack of proper aerodromes. Can local authorities not help in the progress of air transport in this country by providing aerodromes, and what is equally important, by providing to-day the nucleus of what is going to enable them in the future to reap the benefit of being well served by air transport?

LANDING GROUNDS, A FEW NOTES ON THEIR CONSTRUCTION

By W. E. C. CHAMBERLAIN, M.Inst.M. & Cy. E. (Chief Assistant, City Engineer's Department, Portsmouth)

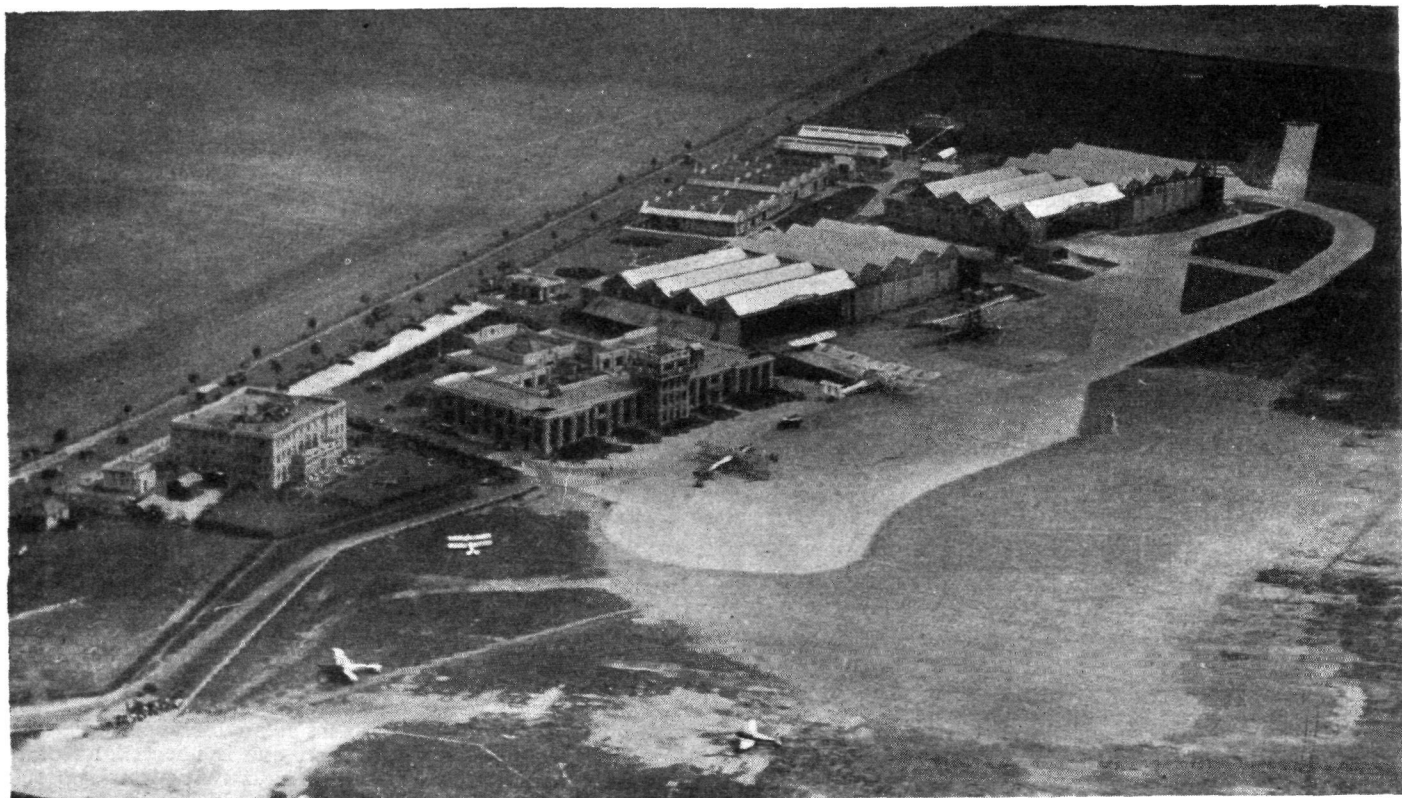
THE inauguration within the past year or so of regular air lines of communication between many of our larger towns has not only served to demonstrate that the day of civilian air travel as a common-place is at hand, but has also revealed the deplorable lack of landing facilities by which civil aviation in this country is so severely handicapped.

It is true that some of our larger and more progressive municipalities have taken the long view and provided well laid out and equipped aerodromes, and they are to be congratulated on their foresight. It is obvious, however, that the future of civilian air travel does not depend on the construction of a relatively few costly aerodromes, but rather on the maintenance of a large number of less elaborate, but efficient, landing grounds, each having easy road communication with a centre of population. By the word "efficient" is meant accessibility to its township, the freedom of its air approaches from obstruction and the quality of its landing surface. "Centre of population" is intended to mean every town of 20,000 inhabitants and over.

To the average town, the siting and construction of a landing ground should not present insuperable difficulties. The chief deterrent to most local authorities, however, is the one of capital outlay involved in the acquisition of the necessary land, and its preparation and equipment. It is difficult to correct the impression that an aerodrome must necessarily mean something on the scale of Croydon, Bristol, Portsmouth, Hull, or other large airports. Huge hangars, terminal buildings, aircraft factories, directional wireless, and large staffs, all are visualised when the word "aerodrome" is mentioned. And, all that "aerodrome" need really mean is a level, well-drained stretch of fog-

free ground, having a good bearing value, reasonably unobstructed approaches from the air, and with a clear run of at least 600 yards in all directions. Some means of identification from the air and a wind stocking on a scaffold pole, complete the aerodrome. There need not be a single building on the site to begin with, although the provision of at least a shed with a stock of petrol in cans, fresh water laid on, a telephone installed, and a handyman in attendance, will prove an advantage. The handyman can be responsible at the outset for the upkeep of the landing ground, boundaries, etc., check and book the arrival and departure of aircraft, collect landing fees (if any), and provide the Clerk to the Council with the information necessary for completing the periodical returns to the Air Ministry. No specialist knowledge is necessary for this class of work, and any man possessed of the average amount of intelligence and common sense could make a success of the job.

The actual siting and construction of the landing ground does, however, require careful consideration. To the engineer and surveyor instructed by his Council to investigate and report on the possibility of the establishment of an aerodrome in his district, choice of site will be his first care. A perusal of the Air Ministry's "Notes on the Location, Size and General Equipment of a Site for a Civil Aerodrome" will provide a valuable guide as to leading essentials. He will probably find that his field of investigation is narrowed down to the limits of two or three areas. Having formed his opinion as to their adaptability to the purpose, he will be well advised to have his views placed before the Air Ministry. The ready advice and helpful criticism from this department may be relied upon to assist him in his final choice.



LONDON : London does not possess a municipal airport, and its air terminal is the Air Ministry-owned airport of Croydon, to which our main air lines all run. (FLIGHT Photo.)

When the site has been chosen, and negotiations for its acquisition concluded, the engineer will then be faced with the task of the preparation of the landing ground.

A plan to 1/2,500th scale, taken from the Ordnance sheets, should first be prepared, and the contours of the ground obtained and plotted thereon. The existing methods of drainage should, at the same time, be thoroughly investigated and their apparent efficiency or otherwise noted. If a good system of main ditches is existent it will be found a safe rule to follow their course where practicable when planning the routes of the main drains. This is not, of course, a hard and fast rule, but its adoption will facilitate the planning and prove an economy. Ditch invert levels should be taken and plotted upon the plan, together with such information as the location of local high and low spots, depths of ponds (if any), the nature of field boundaries which have to be removed, etc. The clearance of weeds, hedges, trees, etc., can be carried out by everyday methods. Complete elimination of roots should be the objective.

From the contours, any area having a steeper gradient than 1 in 50 can be readily identified and provision made for reducing such gradients to conform with the Air Ministry's requirements. Experience has shown that long gradients of from 1 in 80 to 1 in 120 are excellent for facilitating the run-off of surface water. A dead level site should not be aimed at, as it increases the difficulty of efficient drainage.

Levelling of the ground can be divided roughly into two classes:—(1) Areas which only require gentle grading, and (2) those where mass cut and fill will be required.

In the first case, all areas over which no more than 12 inches of excavation or filling is necessitated can be successfully treated by general traversing with tractor and grader, and may be estimated for, or priced at, rates per acre. Areas over which the depths to be treated exceed 12 inches should be billed in cubic yards. Cross-sections of such areas should be taken and plotted, and the required cut and fill indicated. Reliable quantities may be then obtained and good tendering result therefrom. Stripping top soil and replacing it after levelling may also be found to be necessary in the case of mass cut and fill to ensure a good growth of grass and clover.

When grading ploughed and cultivated lands, particular care must be paid to the filling-in and consolidating of furrows and unwanted ditches to ensure against subsequent settlement. A badly-filled depression may have serious consequences when the landing ground is in commission. During grading, flints and stones should be removed from

the soil, or damage will be caused to the mower blades at a later stage.

The bearing capacity of the ground is also very important, and the Air Ministry's test of slowly running a loaded 3-ton lorry over the ground should be regarded as a minimum. Heavy and continuous rolling with water ballasted gang rollers towed by tractors of the caterpillar type will result in a thoroughly consolidated surface. Such rolling a day or so after heavy rain will give the maximum consolidation results apart from indicating any soft spots.

A highly consolidated surface will give a fairly high degree of impermeability, and from this it will be seen that surface drainage presents an interesting problem. The landing area should be divided into definite areas for the purpose of drainage. The amount of run-off should be calculated and the direction of surface-flow ascertained. Time of run-off should be taken as instantaneous, as it is obviously necessary to clear the ground of water as soon as possible after the rain has started. The size of the main drains can be arrived at in the usual way. Branch drains should be treated as interceptors and laid diagonally across the gradients of the ground at intervals of not more than 100 feet. To perform the double duty of surface and subsoil water collectors, butt jointed land drains of suitable diameter should be laid to fall towards the main drains and the trenches carefully filled in solid with good porous clinker. Graded gas clinker is admirable for this purpose and enables the intercepted surface-flowing water to percolate down into the land drains and thence to the mains. For obvious reasons branch drains should not be constructed until after the satisfactory completion of the grading and consolidation processes.

The completion of the drainage signals the commencement of seeding. The choice of seeds for the ground will depend on the nature of the soil, but the resultant growth must be one which is capable of taking hard wear. Hard fescue and dwarf seeded perennial ryegrass give a sturdy root and tough grass, whilst certain types of clover will provide the creeping root which will rapidly heal the scars made by aeroplane tail skids. A graded mixture of such seeds sown at about 100 pounds per acre should give good results. A slight loosening of the top $\frac{1}{4}$ to $\frac{1}{2}$ inch of the consolidated ground by cross disc-harrowing will be necessary for successful sowing. Spring and autumn sowing have proved equally satisfactory. Intelligent mowing and rolling during the early growth of the plants will result in a well-knit turf.

Before the landing ground can be put into commission a licence has to be obtained from the Air Ministry, and

before granting this licence a thorough inspection is always made by an officer of the Ministry. If the condition of the ground meets with his satisfaction at the first inspection, the engineer can congratulate himself that his work has been well done.

With regard to maintenance, the chief concern seems to be in keeping down the growth of the grass during the growing season. With large airports, continuous mowing may be necessary, but with smaller landing grounds there are the alternatives of controlled grazing or permitting

the grass and clover to grow to scything height and allowing local horse owners systematically to cut it and cart it away.

During the autumn the tops of the clinker drains should be raked over and topped up as required, while the preservation of surface consolidation by frequent medium heavy rolling is also essential.

From the foregoing it will be seen that the construction and maintenance of a landing ground need not be beyond the scope of any progressive local authority.

THE BUILDINGS AT SOMETOWN-IN-AIR

By GRAHAM R. DAWBARN, M.A., F.R.I.B.A., M.I.Struct.E., A.F.R.Ac.S.*

I AM asked to write on "The Design of Buildings Suitable for a Municipal Airport." My best course is to describe briefly the sequence of building operations that took place between 1934 and 1944 at Sometown-in-Air.

The Council obtained an area of 250 acres of comparatively flat land within four miles of the town, well served by a secondary main road. Councillor Bligg moved that the whole area should be surfaced and immediate steps taken to erect buildings of a dignity worthy of the name of Sometown. Councillor Blogg, on the other hand, argued that, since the amount of initial traffic was uncertain, it might prove financially unsound to develop the whole area and that the first buildings should be as economical as possible. He moved that advice should be obtained. After eight months of discussion, this was agreed, and four months later the Council received a Report. The first portion of this report was devoted to what was called the Ultimate Scheme which, it was expected, might be in full use in 1950. It was illustrated by layout plans of the whole area, and by sketch plans and elevations of each proposed building, but what caught the eye of Councillor Bligg was an air view showing ranges of hangars and stores, quarters for a local flying club of obvious affluence with own lockup hangar adjoining, public enclosure with long covered verandahs and tearoom, at least six full-blown factories and a complete terminal building. On examining the sketch plans of the terminal building, he was further impressed in finding that it included accommodation for airline passengers, operating companies, taxi services, sales organisation, immigration and Customs, mails, weather bureau, general administration and control. A note on the total estimated cost temporarily staggered him, and Councillor Blogg seized the opportunity to turn on to further sections of the report. After passing pages devoted to estimated traffic flows, expected rentals and returns, servicing, lighting, fuelling and so on, he came to a comparatively small section headed "First Stage." It argued that, as there was not at present even a local flying club and as no airline had yet definitely staked a claim, the aerodrome could only look for casual activities at the start, and that it was therefore essential to keep first cost as low as possible. After further discussions it was decided to carry out the first stage as advised, the two main items to be included being (a) levelling, draining and surfacing a carefully selected initial landing area of 75 acres, and (b) the erection of one building to act as hangar, store, workshop and offices, and to instal at once the beginning of an electric sub-station served from the main in the road and to carry out the first stage of a sewage-disposal plant in a carefully selected site in such a way that it could be greatly increased in the future.

The levelling, draining and sur-

facing contract was let to Huncas, who, nine months later, completed their work at a cost of £1,825. Meanwhile, action was taken with the building. The report had suggested a building with a central unobstructed space 90 feet wide by 80 feet deep and two aisles 15 feet wide, one for stores and benchwork and the other offices, lavatory accommodation and small refreshment room. The central space was to have a clear height throughout of 12 feet with doors 12 feet high and 70 feet wide, and the estimate given for the complete building, with 700 square yards of tarmac outside, was £2,500.

Councillor Blegg then came forward as an expert and proved that the cost of supplying and erecting the steelwork, coverings, roof glazing and windows of a building of this size should not exceed £1,100. In support he produced an estimate for this amount which he had unofficially obtained. It was, however, found, to the general surprise, that the cost of the "builders' work," including foundations, concrete floor and tarmac, partitions, heating for offices only, lighting, painting and a limited amount of sanitary work, was more than the "shell" of the building, and, on tenders being obtained, the cost was found to be: steelwork and shell £1,020, remainder £1,405, total £2,425. The roof was of corrugated asbestos and the wall coverings of corrugated iron.

After work had started, Councillor Blagg pointed out that there was no control tower, which he understood was essential for any self-respecting airport. The reply was that a control tower was almost essential for night flying and valuable for really congested day flying, but that all at present required was an office with a good view of the landing area.

The aerodrome was opened in great style, and on the opening day the accommodation found quite inadequate both for aircraft and visitors. It then settled down to a period during which the accommodation was adequate.

* Mr. Dawbarn is in partnership with Messrs. Norman and Muntz, as Architect and Aeronautical Consultant.



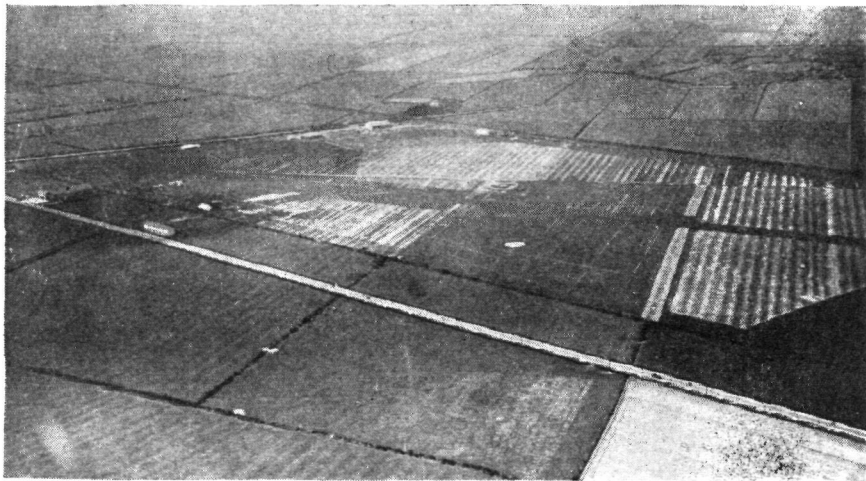
BLACKPOOL : Blackpool Aero-drome at Stanley Park is an ideal centre which caters for the many flying enthusiasts who visit that resort.

HULL : Hull Municipal airport at Hedon is another which is perfectly free from all obstructions. (FLIGHT Photo.)

During the ensuing winter progress was slow. A spare room in the hangar was taken over by an air-taxi company, who bought a machine and carried out three or four special charter flights, and a local flying club was formed, but postponed its activities until the spring. Some excitement was caused by the statement that Ubiquitous Airlines, Ltd., were starting a new internal line embracing Sometown, but nothing more was heard.

In the spring, things began to happen. The Flying Club bought a machine. "Ubiquitous" made a trial flight and brought ten passengers, and another air line started overtures. Since building takes time, it was necessary to consider the next and even the next-but-one stage. It was too late for a permanent building to be of use that summer, but quite an attractive weather-boarded hut was erected, the grass mown round it, and a few flowers planted. This provided a couple of rooms for the Club and waiting accommodation for air-line passengers and other visitors. Joy-riding increased in popularity, and on fine Saturdays it was found necessary to fence off the public from the landing field. There was an increased demand for meals and the small refreshment room found larger quarters in the hut. It was evident that considerable preparations must be made for next spring, and Councillor Bligg moved that the complete terminal building be put in hand immediately. There were also occasions when increased hangarage was required. Discussion was still raging when "Ubiquitous" started their regular services, and, to the general satisfaction, were able to say that these exceeded their expectations.

Plans were prepared for a further hangar—this time 120 feet by 100 feet, with doors 90 feet wide and 15 feet high—and the original sketches for the terminal building were reconsidered. It was decided to prepare working drawings and obtain tenders for about half of the original building, designed so that it could readily be extended later. The lowest tender was £7,130, and, in some trepidation Councillor Blogg cast a favourable vote. It was unanimously agreed to build half the final building in permanent materials rather than "jerry-build" a larger floor area. This was started in August, finished in February, and furnished and staffed ready for use in March. It was found economical to go the full height of the control tower, but this was at present used by the Aerodrome Manager and his staff, since a control officer was still not justified. Downstairs were passenger waiting hall, proper fully-fledged restaurant and kitchens, bar and lounge; while



one wing was devoted temporarily to private quarters for the Flying Club. It may be noted that considerable argument was aroused over quite a small point—whether ladies were to be allowed in the bar. The answer was in the negative and plans changed accordingly.

This terminal building freed the temporary hut. This hut had been specifically mentioned in the original report, and was so sited that it could, when occasion arose, be handed over as a "public enclosure." Its life was, therefore, extended and a verandah added, giving a fine view over the whole field.

Brief mention only need be made of the further stages; how the landing area was increased twice in three years; how three other hangars, one including a large stores block and costing as much as £9,000, were erected during the same period; how manufacturers began to arrive with their factories, showrooms and offices; how the Club, now nearly as affluent as forecast, moved from the terminal building to their own special corner, gay with gardens and tennis courts, but efficient with hangar and flying school; how roads and car parks, garages and petrol stations, hair-dressers' and picture postcard stalls appeared and multiplied; and how, one day, Councillor Bligg chanced on the original airview and found it less orderly, less comprehensive and less beautiful than the latest air photograph of the real and living airport of Sometown-in-Air.

The moral is soon pointed. Sometown-in-Air and Othertown-in-Mud had long been rivals. They fought industrially and athletically. Now all is over. Why should industries settle in isolated places only accessible by road or rail? As Alderman Sir Stickley Blugg said when the Sometown XI won the League Championship: "You cannot expect a team to be fresh after a six-hour car-and-rail journey, but you do expect them to give their best after one hour's journey by air." [A moral which might equally well refer to business.—ED.]



BRISTOL : The Bristol airport is well placed for air traffic to the Irish Free State.

Some British Triumphs with NAPIER Aero Engines

1918 A Napier-engined D.H. aeroplane climbed to a height of 30,500 ft. in 66 min., the greatest height at this date reached by an aeroplane.

1919 A Napier engined D.H. aeroplane won the Aerial Derby. Speed, 129.3 m.p.h.

1921 A Napier engined Gloster aeroplane won the Aerial Derby. Speed, 163.4 m.p.h.

1922 A Napier-engined Supermarine flying boat regained the Schneider Trophy for Great Britain at a speed of 149 m.p.h.

1923 A Napier-engined Gloster aeroplane won the Aerial Derby. Speed, 192.4 m.p.h.

1926 The first non-stop crossing of South Atlantic Ocean carried out by Commandante Franco flying a Dornier flying boat with two Napier engines.

1927 Schneider Trophy regained for Great Britain by a Supermarine-Napier seaplane flown by Ft.-Lieut. S. N. Webster, A.F.C. Speed, 281.669 m.p.h. Two machines completed the course—both fitted with Napier engines.

1928 The greatest formation flight ever carried out was made with four Supermarine-Napier Southampton flying boats, each fitted with two Napier engines. The machines flew from England to Australia, round Australia, and back to Singapore, covering 180,800 engine miles without mechanical trouble.

1929 The first non-stop flight from England to India was carried out with a Fairey monoplane fitted with Napier engine. 4,130 miles in 50 hr. 38 min.

1930 For the fifth successive year Napier engines were selected by the Royal Air Force for their annual Service flight from Cairo to Cape Town and back. As on previous flights, no mechanical trouble was experienced.

1931 The first and only non-stop flight from England to Egypt was carried out with a Fairey monoplane fitted with Napier engine. 2,857 miles in 30 hr.

1932 Captain Sir Malcolm Campbell set up a World's Land Speed Record of 253.968 m.p.h. with his Napier-engined "Bluebird" car.

1932 Fourteen officers and 534 men were transported from Ismailia to Iraq and back—a distance of 1,728 miles over nearly waterless desert. The aircraft used were Vickers "Victoria" troop carriers, each fitted with two Napier Lion engines.

1933

Squadron-Leader O. R. Gayford, D.F.C., A.F.C., and Flight-Lieut. G. E. Nicholletts, A.F.C., by flying a Fairey (Napier) monoplane from Cranwell, England, to Walvis Bay, South-West Africa, set up a World's long distance non-stop flight record—a distance of 5,309 miles covered in 57 hr. 25 min.

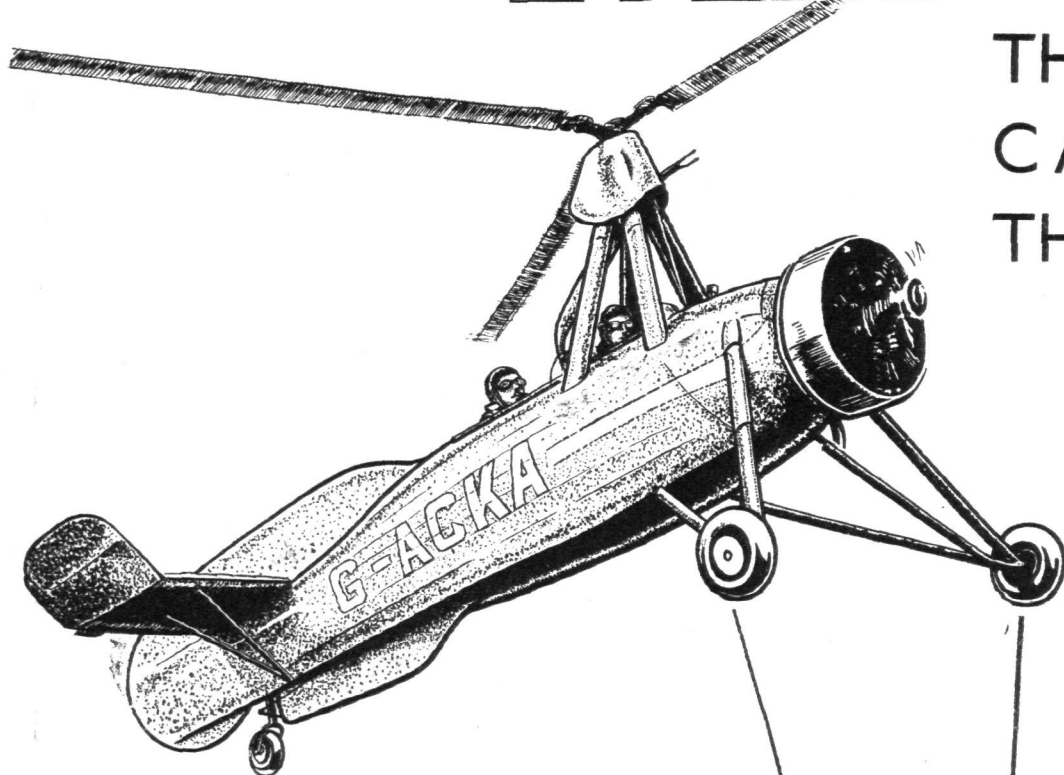
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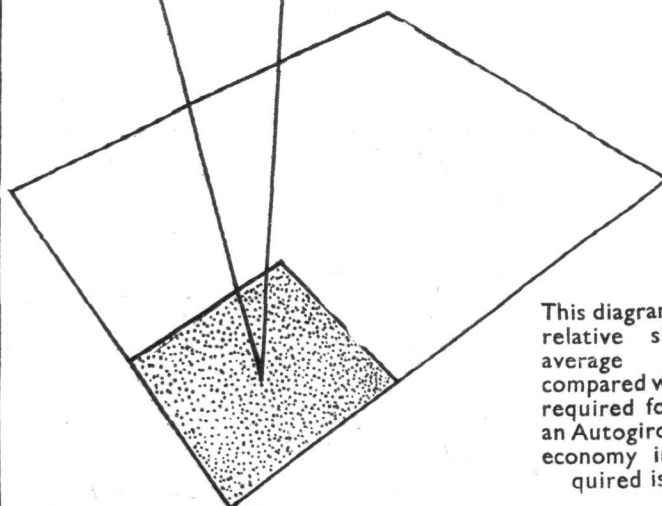
The practical convenience of air travel will only achieve maximum utility when every town of importance has its aerodrome.

One of the greatest difficulties in building aerodromes for towns, particularly in industrial districts, is the acquiring of large enough areas for safe operation of orthodox aircraft.

The simple solution to this vital problem is the Autogiro.

The C 30 P AUTOGIRO can take-off in a few yards, climb steeply over obstructions, descend vertically and land without forward run. It can be operated safely in small areas such as would be impossible for fixed-winged craft. It is an air vehicle which can fly from town to town, completely independent of the huge open spaces essential for aeroplane operation.

More Aerodromes—Yes! But Autogiros where aerodromes are at present impracticable.



This diagram shows the relative size of an average aerodrome compared with the area required for operating an Autogiro. The great economy in space required is obvious.

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INTER-AERODROME NAVIGATION

By C. B. COLLINS

(Mr. Collins is Technical Assistant in the Directorate of Civil Aviation.)

ASSUMING every important town in the country to possess its own aerodrome, the question arises as to what navigational facilities will be required to assist the pilots of aircraft flying from aerodrome to aerodrome.

The essential facilities are an efficient weather service and a W/T. direction finding organisation. In addition, for night flying, aerodrome and airway lighting, and for bad visibility conditions, some form of aid to blind landings will be required.

Let us examine these in turn, remembering that all are interconnected.

Any pilot, before starting on a flight, wants a picture of the weather prevailing over the route, together with an indication of any changes likely to occur throughout the duration of his flight. The term "weather" as here used embraces a knowledge of the following simple factors:— (1) Prevailing conditions, *e.g.*, whether blue sky, cloudy, raining, snowing, foggy, misty, etc. (2) Visibility. (3) Amount of cloud, height of base of lowest cloud. (4) Direction and speed of the wind.

We can, by taking the primary organisation of the Meteorological Office, superimpose on it a secondary framework whereby brief reports covering the four simple items to which reference has already been made are received. To make this secondary organisation effective, the simple observations must, when taken, be immediately transmitted to the Central Meteorological Office. The Central Office must then analyse the data and distribute it to the aviation world. Owing to the initiative of the Automobile Association, there is already in existence at the Heston Airport a weather broadcasting station, now operated by the Air Ministry, which sends out at regular three hourly intervals brief details of the weather in simple form for selected meteorological stations. Any changes in the weather in the intervals between regular reports are further broadcast at hourly intervals. All these reports are capable of reception during flight.

If the secondary organisation adumbrated above is applied on a large scale, the present process would become tedious. Even brief reports of a 100 stations would take some time to broadcast, station by station, and the listener who was interested in, say, number 99 on the list would become, to put it mildly, impatient. It would thus seem that the information must be analysed and apportioned to well defined regions. The bad features must be picked out and reference made to them region by region. A pilot

interested in any particular route would then only have to listen for broadcasted information concerning the region or regions through which his intended route passed. If he wished to obtain further details, he could do so by referring to the nearest meteorological centre. There are 20 such centres now in existence in this country.

For regular commercial routes, properly equipped meteorological stations will be required at terminal points. There is no difficulty concerning an adequate organisation. The routes from Croydon to the Continent furnish an example of the type of organisation required. Anyone interested can inspect the organisation and see it working for himself. So far as the general broadcast is concerned, the principal aim should be that the results of the observations taken should be available to the public with as little delay as possible. One does not want to be told at 3 p.m. that it was raining at Aberdeen at 1 p.m. One wants to know this at 1.15 p.m. The brief reports required can easily be supplied by the aerodrome staff. No special skill is necessary.

Rapidity in distribution may in the future be attained by some form of picture transmission, whereby a graphical representation of the essential information, plotted zone by zone, is received automatically and displayed at every aerodrome.

The day may not be far distant when the meteorological elements will be plotted graphically on to a map of the country, divided into, say, 25-mile squares, and the whole broadcast by television process. If television apparatus becomes as universal as has the present radio receiver, the future pilot need not even bother to visit his aerodrome. He can make up his mind from his own home whether or not to brave the elements. Now we come to the question of wireless direction-finding.

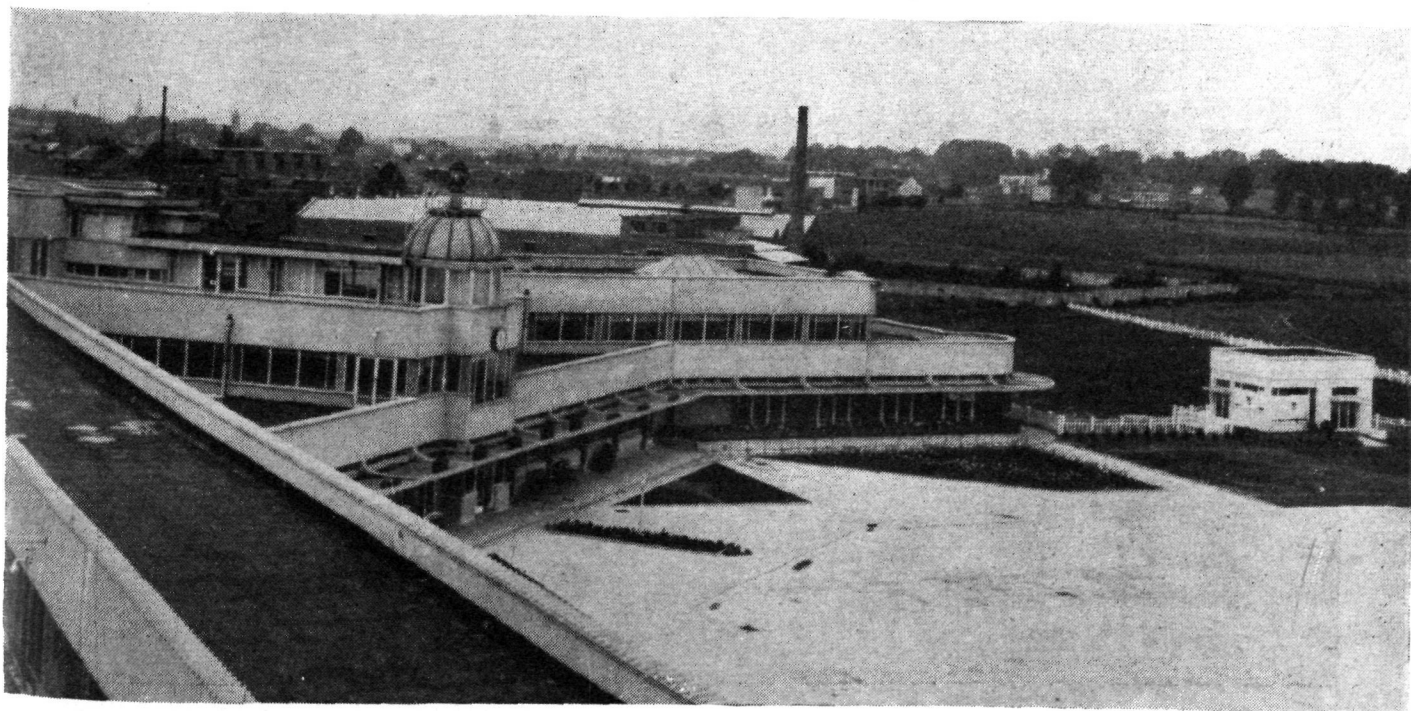
The various systems in use can be divided into two main categories.

A.—Those in which direction is determined by ground stations and

B.—Those in which direction is determined in the aircraft.

Under the first or A category we have (1) the Bellini-Tosi system, (2) the Marconi-Adcock system.

Under the second or B category we have (3) Wing-Coil system (Marconi-Robinson type), (4) Rotating-Beacon



ANTWERP : This shows the excellent layout of one of the larger Continental airports. (Photo. J. Dower.)

system (Orfordness type), (5) Equi-Signal Beacon system (Croydon type), (6) Bellini-Tosi system (in the aircraft).

Of the above, No. 6 can be dismissed as being unsuitable for other than long-distance or oceanic flights by large aircraft carrying experienced navigators. No. 2 is really only a refinement of No. 1, where, by using a specially designed antennæ system, the vertical component of refracted or reflected waves is eliminated and the bearings then obtained become reliable by night.

Navigation never relies on any one medium. It requires as many aids as it can be given. Air routes must therefore be provided with airway beacons which form a visual check on the course being maintained. The interval between light beacons is determined by local conditions, such as the type of country and weather conditions, as well as by the power and type of the beacons themselves. The siting of beacons is a matter for expert advice, but they should not be placed on very high ground where they will become obscured by low cloud, nor on low flat ground where they will be screened by mist or fog. The above facilities dispose of the general requirements of air navigation, for any type of weather.

To follow up the advantages thus conferred while aircraft are in transit from one aerodrome to another, means must be provided to ensure that aircraft having arrived in the vicinity of its aerodrome of destination can finally locate its exact position at night or in bad visibility, and then proceed to land. This calls for the following equipment:—

(a) A location light beacon, possibly of the Neon type as at Croydon (a beacon showing a *green or blue* light has yet to be tried out).

(b) Aerodrome lighting; floodlight, boundary lights and obstruction lights, illuminated wind Tee.

(c) Pyrotechnic signals for use in foggy weather. These signals are fired into the air up to a height of 1,000-1,200 feet on the approach of an aircraft and give the pilot a precise indication of the position of the landing area. This method may sound primitive, but it has proved very effective at Croydon on days when aircraft could be heard passing close to the aerodrome but yet could not be seen.

(d) The Localising Beacon (Radio). This is a miniature of the main navigational equi signal beacon. Its function is to lead aircraft to the aerodrome in bad weather in the best direction of approach, having regard to the prevailing wind, if any, or to the best landing run if no wind. Its range need not be more than 10 miles as a maximum, but the local beacon must be capable of serving any direction

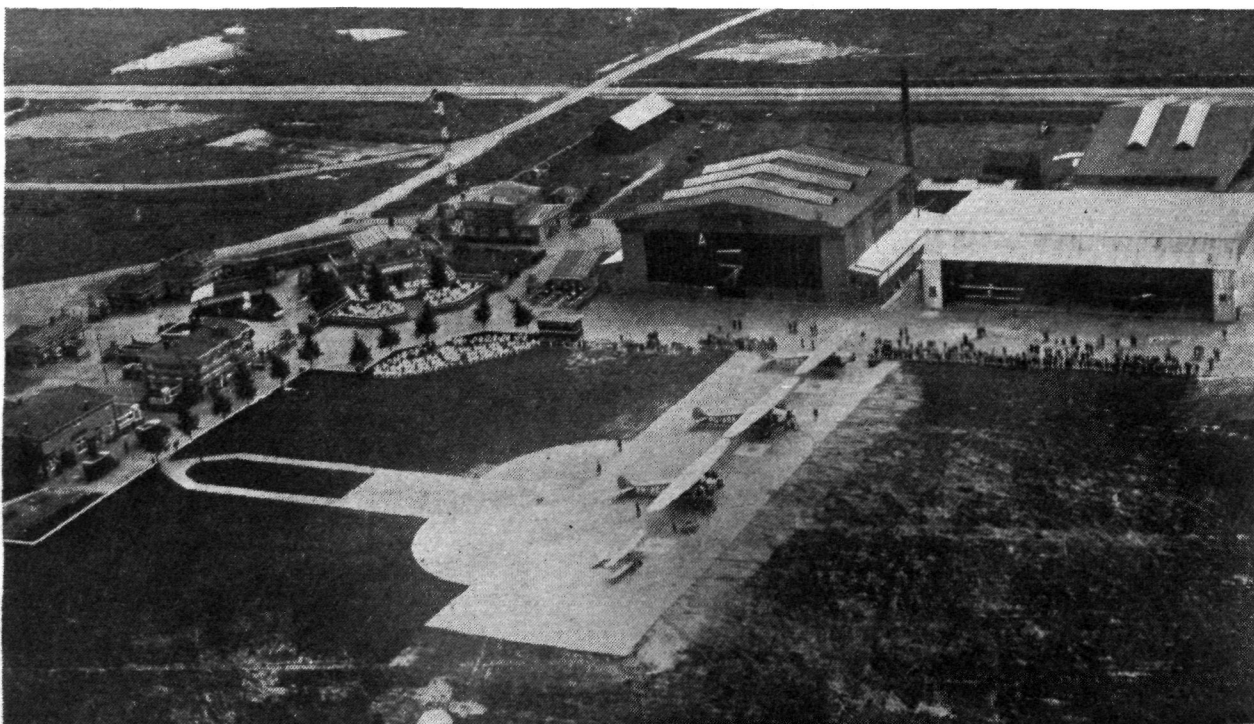
of approach, and not be fixed on a constant track as is the case with the main navigational beacon.

(e) Marker Beacons (Radio). These beacons are small transmitters, sending out a vertical field of energy, which, either visually or aurally, give an indication to the pilot that he is over a particular spot. This spot is located at such a distance from the centre of the aerodrome that an aircraft arriving over it at an altitude determined by the characteristic gliding angle and gliding speed of the particular aircraft in question, can shut off its power plant, and, by the aid of suitable instruments and the localising beacon referred to at (d) above, be brought safely down to a point over the centre of the landing area, within a few feet of the aerodrome surface. It is only on rare occasions that visibility is so poor that the ground cannot be seen from an altitude of, say, 25 feet, so that the final process of landing, viz., "flattening out," can be completed in the normal manner. Possibly four marker beacons in all will be required to enable aircraft to be led into the landing area from any direction of approach. Alternatively, a mobile beacon may prove the ultimate solution. This method of assisting aircraft to land in bad visibility is at present still in the experimental stage, but there is every hope that it will prove of real practical utility.

The foregoing list of requirements may seem formidable. How far are all these facilities really justified? The following figures may help to show the growth of air traffic in recent years.

	1923	1933
Number of commercial aircraft in and out of Croydon, month of August	694	1,237
Number of passengers in and out of Croydon, month of August	2,995	11,957
Average number of passengers per aircraft	4.3	9.7
Number of current pilots' Licences	A. } 96 B. }	A. 2,413 B. 373
Total	—	2,786
Number of aircraft with Certificates of Airworthiness	141	855

Who would have thought thirty years ago that the motor industry would have gone ahead so rapidly? Who would have been bold enough thirty years ago to finance a distribution company for the installation, all over the country, of the innumerable servicing depots that are now taken as a matter of course, and which are now paying their own way?



ROTTERDAM : The general arrangement of the buildings and gardens at Rotterdam shows that airports can be very attractive.

AIRPORT COMMUNICATIONS

By DUNCAN SINCLAIR*

IT frequently happens, at the present time, that municipal and other authorities are brought to consider the development of airports; and, in so doing, they have to decide what communications facilities should be provided at these ports.

It is an unfortunate fact that, all too often, the advice given them is to lay out substantially large sums of money on the construction of an airport equipped far beyond their immediate requirements. They are, in fact, invited to expend much more money than is actually justified in the initial stages of development.

There has recently been a great deal of talk in this country about municipal and other airports, and a considerable diversity of opinion is known to exist as to the best process for correct development and expansion. Undoubtedly this is largely due to the reason that there is practically no one fully in a position to advise competently on *all* the various aspects of airport work. The "approval" given by the Air Ministry to consultants (and by which their status is often judged by municipal authorities) is extremely limited in its scope, and does not cover very much beyond a few of the simplest phases of the general work involved.

It would appear that either this system of "approval" should be waived altogether, or that it should extend to its proper limits.

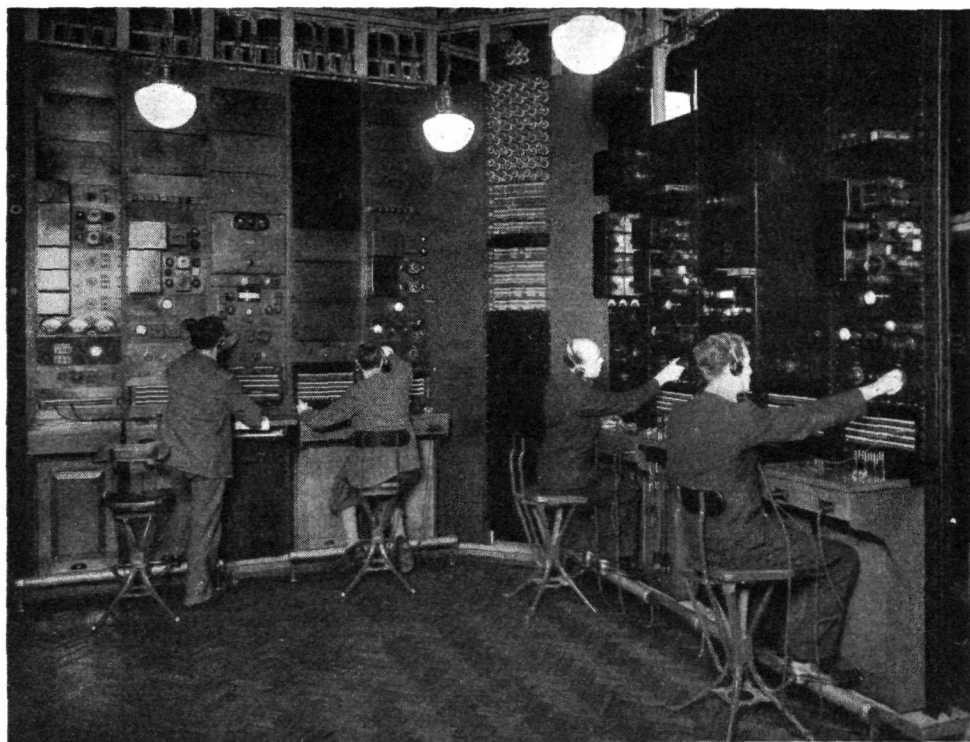
One of the very most important sections of airport work is Electrical Communications, consisting of:—

- (a) Wireless signalling and radio navigation.
- (b) Telegraphs and telephones.
- (c) Lighting and beacons.
- (d) Electrical recognition services.
- (e) Electrical supply services.
- (f) Weather services.
- (g) Cablegrams, codes and ciphers.
- (h) Survey, mapping and planning.

This is, again unfortunately, one of the sections for which no "approval" is obtainable. As soon as the site of an airport has been chosen and the architects' plans have been approved, some aspect of "communications" at once comes to the fore. The common-sense principle of expansive development, both in the airport as a whole, and in its individual components, is, of course, necessary. One might almost regard the early stages of the development of an airport as calling for nothing much more than a level field, clear of flying obstructions, and having a telephone in some convenient building.

As soon, however, as some definite "Club House" or "Office" exists on the site, it is a moot point whether there should not also be a radio receiver capable of intercepting one or more of the broadcast weather services. At the present time, probably the most useful one of these services is that originally sponsored by the Automobile Association at Heston, and now continued under the aegis of the Air Ministry. A Notice to Airmen has already been published giving the times of transmission and details of the information disseminated. Several firms in this country have radio equipment suitable for use either in the air or on the ground in connection with this service.

Should it so happen that someone can operate the



OVERSEAS RADIO: Operators controlling traffic to S. America, Egypt, S. Africa and Canada in the Telephone Exchange, Faraday Building, London. (G.P.O. Photo.)

receiver, intercept the Air Ministry synoptics and forecasts and de-code them, it is possible to obtain a complete and regular series of weather messages at frequent intervals. Such operation involves, of course, a good knowledge of the morse and meteorological codes. Useful transmissions are also made by the B.B.C., at certain times of the day, in the form of evening weather forecasts for the ensuing day, and the Daventry shipping forecasts, morning and evening.

It is possible, by the judicious use of these three radio services, to obtain a good insight into present and future weather conditions; and if this can be achieved at the minimum outlay, there is no necessity to pay expensive toll or trunk telephone charges such as are involved in ringing up the Air Ministry Meteorological Office from points in the provinces. Regarded in this way the installation of any conveniently suitable form of radio receiver is an economy right from the start; and, were it possible to make some even nominal charge for the service, the installation would likely prove to be a profitable investment.

As the port progressively develops, the second stage is reached when the "Club House" (with restaurant, or tea room and offices) is built and general amenities are provided for visitors, hangars and sheds also being erected. It is at this stage that the site commences to become an airport, and ceases to be just a landing ground. When this occurs, it is necessary to instal some small private branch exchange, either manual or automatic as the case may be; to make provision for suitable telegraph facilities, preferably in conjunction with a neighbouring post office; to provide some system of obstruction and landing lighting; and to arrange for proper electrical supply services. Unless some previous choice has been made already in the matter of radio the owners of the port will now be well advised to secure some form of radio receiving equipment which is capable not only of intercepting the weather services previously mentioned, but can also be turned with advantage to the reception of B.B.C. programmes (such as dance orchestras), a suitable diffusion of which in the club-house premises can act as an additional attraction to the airport. There are several excellent receivers already on the market which would serve this dual purpose, and these can be obtained, in very pleasing designs, to harmonise with club-house furniture. It is, of course, also possible to obtain such apparatus incorporating gramophone attachments for the reproduction of records.

By dealing progressively with these electrical communications services, it is, naturally, possible to economise; and it is very necessary to economise in every direction during the early stages of the airport's life, when the out-

* Capt. Sinclair is an aviation, wireless, and communications consultant.

lay has been heavy, and before any tangible revenue has begun to be received.

As soon as the airport has regular services running, the third stage is entered upon. It is at this stage, where the port is open for general traffic and service schedules are in operation, that the telephone and telegraph facilities must be extended, and the general electrical and lighting services increased up to full commercial requirements. Although it may not be necessary to dispense with any radio receiving equipment which may already have been acquired, it is now important to instal a radio traffic service comprising both transmission and reception; because in addition to the weather facilities which have already been made available, it will be essential to notify arrivals and departures of aircraft to other aerodromes, and to provide radio and navigational aids.

At the present time it is the fashion to make use of wavelengths of the order of 900 metres for civil air traffic, but it is open to question whether this class of wavelength will always prove satisfactory. Apart from the fact that such wavelengths are sandwiched between the 600-800 metre shipping band on the one hand, and the long wave broadcast services on the other, and that both are constantly tending to encroach, it is also more reasonable to employ shorter wavelengths for aviation work. It is probable that, were it possible at present to afford direction finding services with the same degree of regular accuracy on, for example, a 90 metre wavelength as is possible on the 900 metre wavelength, the days of the 900 metre service would be numbered. The shorter wavelengths are much more suitable generally from all points of view, and if the necessary technique in direction find-

ing in these wave bands can be perfected, a lot of benefit will be derived from the change.

One of the biggest advantages in the use of short wavelengths for aviation is the large number of services which can be rapidly operated close together without mutual interference. In fact, the possibilities of short-wave radio communication have already been amply demonstrated by the long-distance radio telephone services now available to the public, operating in conjunction with the existing land-line telephone systems. A splendid example of the great progress which has been made in this direction exists at the G.P.O. Radio Terminal in Faraday House, London.

If it is possible to achieve satisfactory short-wave duplex services, both telegraphic and telephonic, for airports and aircraft, then it is likely that commercial air services, from a communications point of view, can be dovetailed into the various international circuits. The result of this will be that air passengers, as well as the pilots, can be in constant touch with the rest of the world. There are quite useful revenues to be derived from such an innovation. Such a service would, moreover, provide one of the finest means of attracting the public to make still greater use of air transport.

The communications requirements of airports vary considerably; and, the British Isles are really very small in extent, so that there is not very much room for too many wireless stations. The constructor and owner of an airport should therefore remember that he will be wise to take good advice on his own special needs now, and then to stake a full claim for the future, whilst, at present, using the minimum apparatus possible.

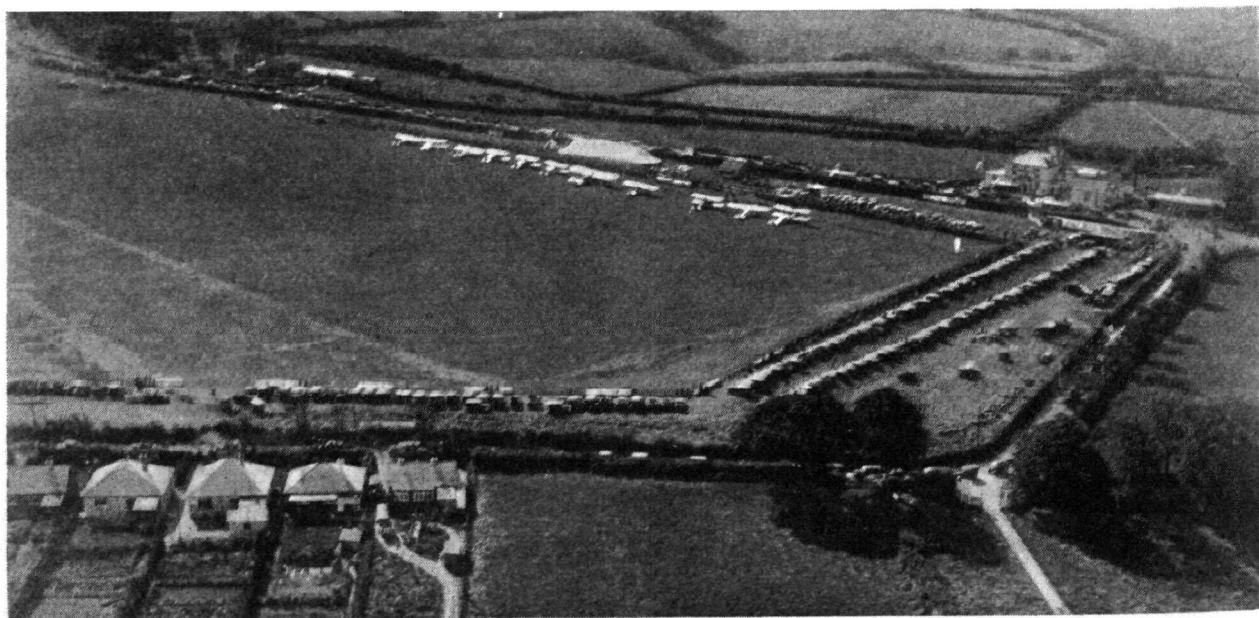
LIGHTING THE AIRPORT FOR NIGHT FLYING

Plan for the Air Traffic of Ten Years Hence

By CHARLES E. WARD (Aeronautical Consultant and Member of the Aviation Lighting Committee of the British Standards Institution)

EVERY landing ground is a potential airport, provided that there is sufficient area around it for expansion to meet the needs of the future, and for that reason it is unwise to spend money on a site which is not (a) the best in the district, or (b) one that can be enlarged without difficulty. No site is worth developing for municipal purposes unless it is suitable for night landings, because air transport, like any other form of transport, must be available at any hour if it is to be of maximum value to the community. Although night flying is not a regular

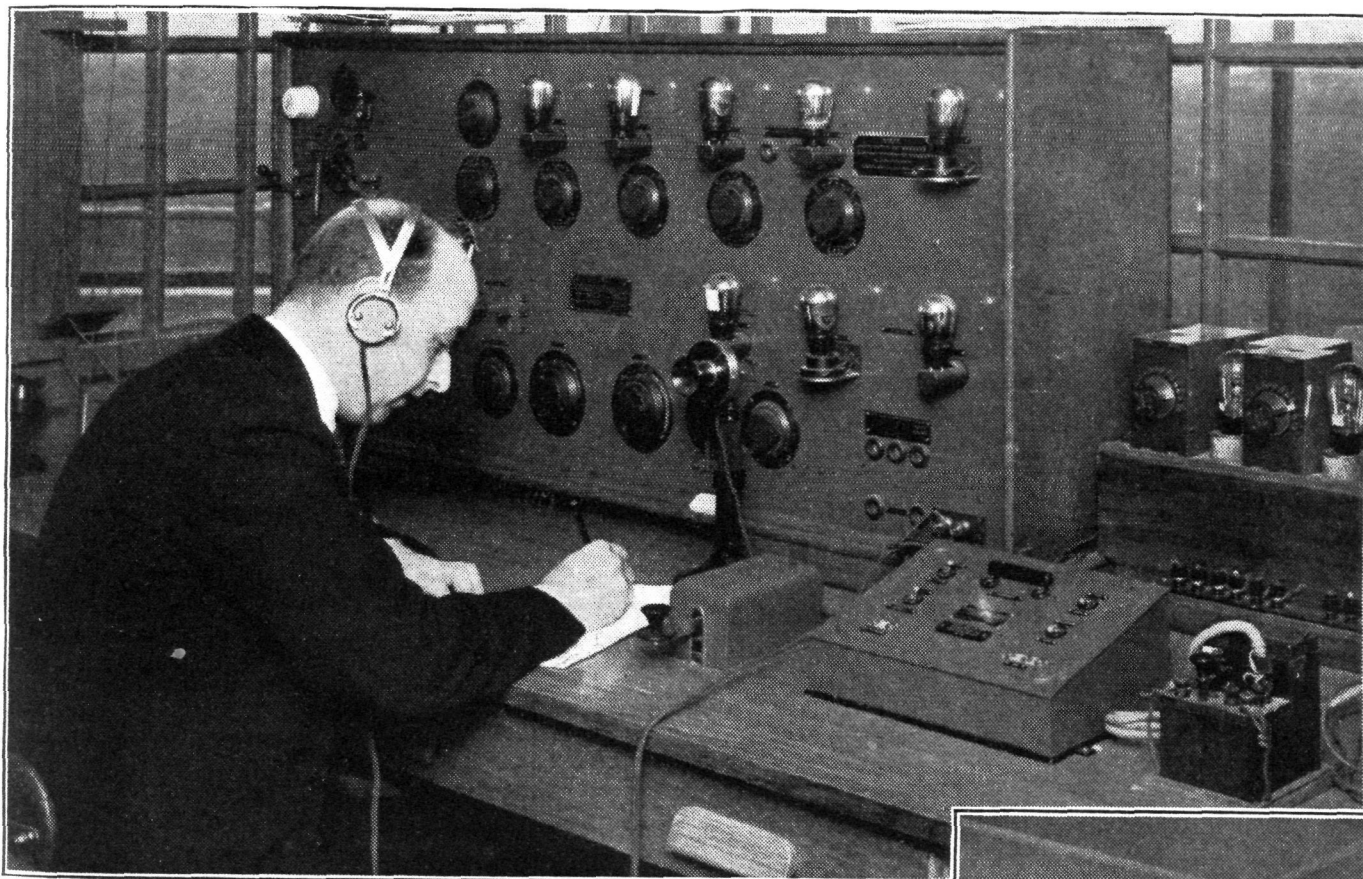
practice in this country, one has only to consider progress in America, for instance, in order to appreciate that it must become of equal importance with that of flying by day. In America, regular night services for passengers, goods and mails cover as great a distance every night as the rest of the world's scheduled services by day and night together. No airport is planned without consideration for the needs of a 24 hour service, even though the complete equipment for night operations may not be installed at the outset. This is true economy, for it means that money



PLYMOUTH: Plymouth's airport at Roborough was opened by the Prince of Wales in July, 1931.

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Marconi apparatus is also installed at the London Airport, Croydon, at the British direction-finding stations at Lympne and Pulham, and at many ground stations on the African and Indian air routes.



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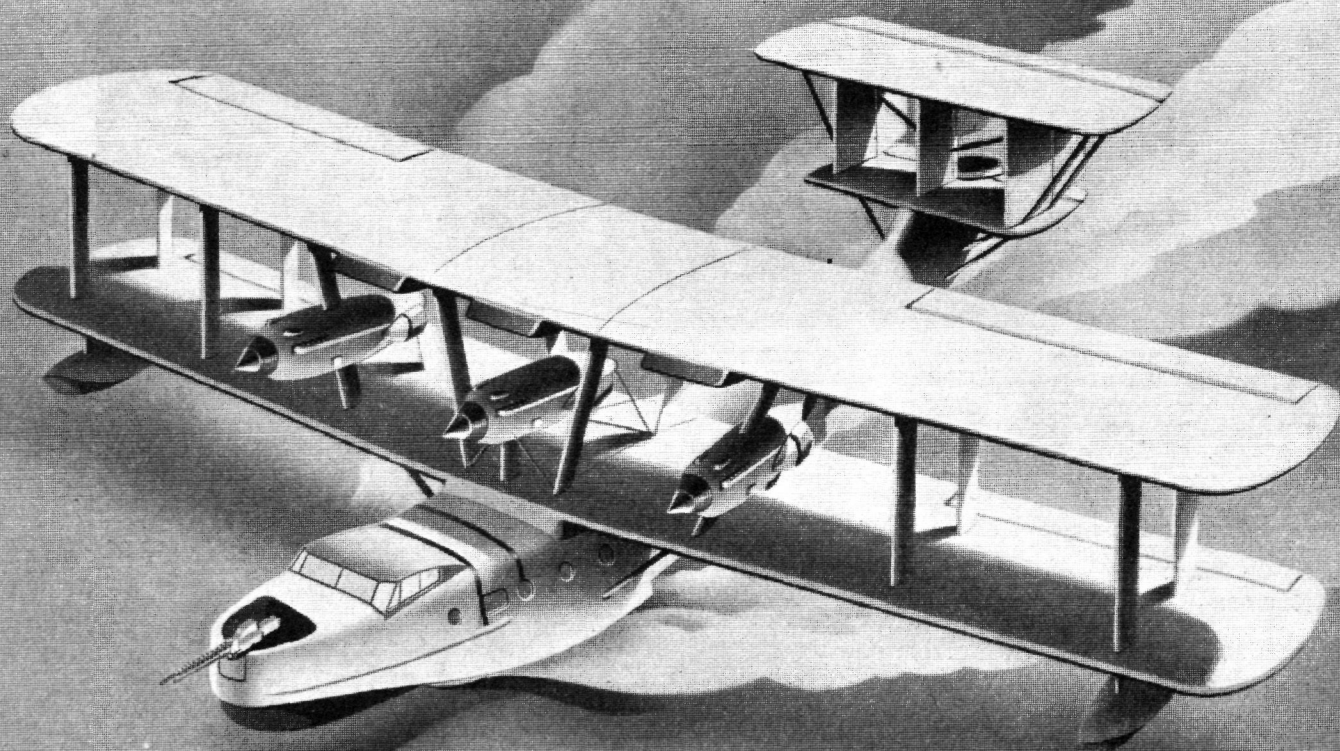
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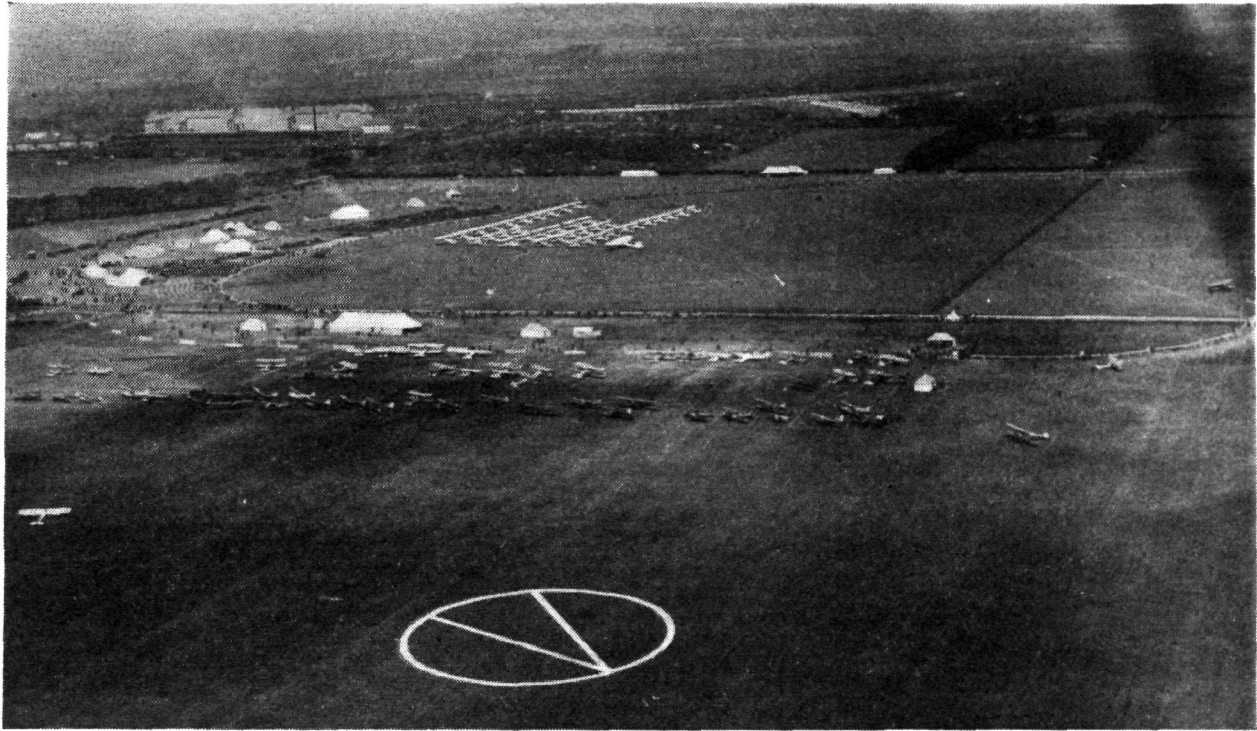
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LIVERPOOL : Liverpool's airport at Speke is one of the largest in the country, and adjoins the River Mersey, thus providing a potential seaplane base. (FLIGHT Photo.)

is not wasted on a site that will have to be abandoned or modified at great expense when night flying becomes essential.

Only an expert can decide whether any given site is the best in the district for night work, but local authorities might like to bear in mind that permanent obstructions within 500 yards of the perimeter of a site and lying outside it may be dangerous to aircraft, and with others situated still farther away may require lights as a warning to pilots operating after dark. The easiest way to avoid the expense of such lighting is to specify from the outset that a municipal site shall be such as to conform to Air Ministry requirements for day and night flying and to ask for an estimate for lighting apparatus that will secure a 24-hour licence.

On the basis that every town must have its own landing ground, even though this need be no more pretentious at the outset than a large field with a petrol pump, a wind direction indicator, a telephone and a man in charge to assist pilots, it is important that such a landing ground should carry the simple equipment needed for a night landing or departure. It will be easier to define such equipment after considering first of all what assistance artificial light can offer to a pilot and what information he wants before a safe landing or take-off can be carried out. The landing is the more difficult, especially if the pilot is unfamiliar with the place. He has navigated, with a check on his bearings by wireless, by obvious landmarks or by route beacons, to within a few miles of the objective. Lights of the town, headlights of motor-cars and possibly road signs are visible, and therefore he needs some signal or indication as to the exact position of the landing ground. Having found it, he needs to know its boundaries, the direction of the wind for the purpose of landing correctly into the wind, and whether there are any obstructions in his way when gliding in for the landing proper. At a first-class airport, these indications are given by means of five different types of lighting equipment, a brief description of which follows, after which it is possible to decide on the minimum apparatus necessary for an occasional night landing.

The exact location of an airport is indicated by means of a beacon, which can be compared to a light at the entrance of a harbour for ships. The boundaries are defined by orange-coloured lights set at intervals of approximately 300 feet around the inside of that area which has been prepared for landing purposes, whilst obstacles dangerous to aircraft in motion are marked with red warning lights. Wind direction is given by means of an illuminated device, preferably in the shape of a letter "T," mounted horizontally and free to rotate with the wind. Finally, the landing

area proper is illuminated by a floodlight, so designed that its beam is parallel to the ground. It is impossible and indeed unnecessary to equip a landing ground with all of these lights for occasional night use. In the first place, a complete installation should be electric, which means that the boundaries must be the final ones before cables are laid, and, further, the ideal equipment for any particular airport may not be apparent until the whole site has been cleared for use and a certain amount of day flying has taken place.

Assuming that all trees on the boundaries of a landing ground and those just outside it which are in the line of flight of a machine taking off or landing, have been felled, the remaining obstacles, such as hangars and other buildings, can be marked as obstacles with hurricane lamps having red shades. Similarly the boundaries can be defined by the same type of lamp coloured orange, these lamps being elevated about 3 feet above ground level. In the absence of a floodlight, wind direction and ground level can be indicated by a line of flares, paraffin, acetylene or electric, arranged on the ground in such a manner that the pilot knows which way to make his approach in order to be into wind, where it is safe for him to touch ground after clearing obstructions on the boundary and the limit of his run towards the opposite boundary. Hurricane lamps and flares can be kept in a lock-up, trimmed and filled ready for immediate use and stacked on a trolley or light trailer that can be pulled or towed by a car. Instructions must be drawn up as to their exact disposition, and anyone likely to be on duty must be taught the uses of the different lights, and in particular, how to set out the flares along the landing path. A beacon at a landing ground is an extravagance, but a floodlight would be invaluable, because it could be made to serve the purpose of a beacon as well as that of lighting the ground.

An airport completely lit for night operations may require current up to 20 kilowatts at one time, which is an important point to note when putting in the electric supply, and this, together with the specification of final equipment, forms part of the plan without which no airport is complete. However, it will be seen that night flying can take place with the aid of very simple apparatus, and every landing ground should be so provided that a pilot can at least make an emergency landing after dark with reasonable safety.

[The British Standards Institution has issued, with the approval of the Air Ministry, a Guide to Aerodrome Lighting, which can be purchased from this office, price 2s. 2d. post free. The same body is preparing a British Standard Specification of Aerodrome Lighting Equipment which will be published shortly.—ED.]



MANCHESTER : Manchester's airport at Barton Moss also serves as a terminal for air traffic to Ireland.
(Aerofilms, Ltd.)

HOW TO RUN A MUNICIPAL AIRPORT

By R. ASHLEY HALL (Member of the Bristol Airport Committee)

IN order to get a clear idea of how to run a municipal airport, we must first consider its purpose and function. It appears to be an area of land conveniently laid out and reserved for the use of all forms of aerial traffic and, put briefly, that is exactly what it is. Motor coaches have their depôts and stopping places, trains start from railway stations and boats operate from harbours. In a similar way aeroplanes have their own harbour, namely, the Airport.

The essential difference between an airport, and an aerodrome or landing ground, is that the former is a site prepared for use by anybody and by any type of aircraft for any purpose, whereas the latter is often laid down for the specific use of one type of operator who may want a field merely as a port of call for a ferry service using one type of machine, or again it may be a field suitable solely for occasionally joy-riding purposes, or yet again it may be a manufacturer's aerodrome, from which to test his new products. The airport, however, is open to all, and it is therefore the duty of the proprietor, in this case the municipality, to provide adequate facilities. The extent of these must be governed by the volume and type of traffic.

To-day, air traffic in this country includes the private operation of small aircraft for sport and business purposes, the use of air taxi and special charter machines, the operation of regular feeder line or ferry services, and sundry other commercial undertakings, such as flying for advertising, aerial photography, municipal survey work, etc.

The barest facilities are a landing area, petrol and oil supplies and a telephone, while a small hangar or even a shed, for the accommodation of passengers, is certainly desirable. An aerodrome on a small scale like this could be operated by a caretaker under supervision of the Surveyor's Department.

A more ambitious type of airport is one where a pilot is certain of finding adequate hangarage, up-to-date weather reports and meteorological information, facilities for feeding his passengers and himself, and a comfortable waiting place, and he may justifiably expect the convenience of some form of night landing equipment, at least for emergency purposes. He should also be able to get minor repairs carried out. The public should be able to hire air taxis and to obtain some form of flying tuition. They will also expect that before long their town will be linked to other important centres by regular air services. The proprietor will have to provide all essentials, such as fire and first-aid equipment.

To administrate an airport of this nature a competent and responsible manager is necessary and the airport should be under the control of a special airport committee and not left to the mercies of a sub-committee of some other committee. The manager will require a responsible clerk who can take charge in his absence and probably a

typist and office boy, also an aerodrome foreman responsible for selling petrol, helping machines in and out of the hangar and acting generally as a garage foreman. The number of groundsmen necessary to maintain the landing area must depend on the actual condition of the surface, type of soil, volume of traffic, etc. Traffic control officers, as such, will only be required when the volume of traffic becomes considerable.

There is a method of reducing the administration expenses in the early days of an airport which it is well worth while considering. Certain flying clubs have been established, more or less on a philanthropic basis, for the purpose of encouraging civil and commercial flying, their object being to bring new people into aviation. A club of this nature is a real asset to an airport. It does not compete with the commercial interests, but it does increase the general use of and interest in the airport. It will have to employ a secretary, an assistant, a chief flying instructor, ground engineer and assistant. The aerodrome proprietor may well consider sharing the expenses of his administrative staff with that of the club. The club secretary can act as airport manager until the duties have increased sufficiently to make it a full-time job. The club instructor can be second in command, the club ground engineer can be aerodrome foreman, and by such a means the municipality will have the services of an administrative staff at a low cost and yet be in no way handing their airport over to a commercial concern whose interest is not primarily the airport, but their own profit. In my opinion a municipal airport is one which should be administered directly by a staff, responsible to the municipal authority, and on a policy defined by them. If it is leased to someone else to run, it is no longer a municipal airport, but becomes a private enterprise; in the same way, an allotment garden leased by a public authority to "Tom Smith" is not a municipal allotment, but "Tom Smith's" allotment. By sharing the administrative staff with a suitable club the administration remains in the direct control of the municipality, and the manager is directly responsible to them.

Now as regards revenue, first there is the rent for space and accommodation, paid by any trading tenants. The receipts for housing aircraft, which should be inclusive of the full use of the aerodrome. The sale of petrol and oil is also a source of income. A landing fee for visiting aeroplanes can be charged like a dock due, but personally I deprecate it very much, at any rate until the traffic is considerably greater than it is to-day, and I would suggest in its place a capitation fee on every fare-paying passenger collected or discharged, and a similar arrangement for freight. An arrangement of this nature leaves the airport free for casual flying and yet allows the proprietor to have a share in the success of any commercial undertaking.

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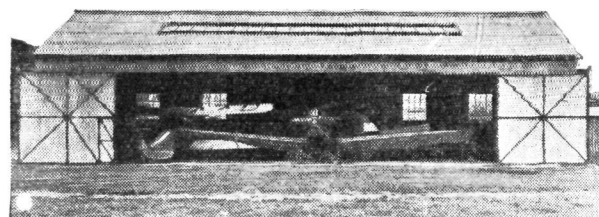
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THE POSITION TO-DAY

A Guide to the Municipal Airport facilities offered by the sixteen established Airports

THE following pages form the second half of our special Airport Supplement, and give details of the municipal airports which have already been established. It has not been possible to write a lengthy treatise upon each airport pointing out the peculiar advantages it has, either by virtue of its position with regard to the country in general, or because of its particular attractions for manufacturers or other purposes. These points were dealt with very fully in FLIGHT for April 15 and 22, 1932, and have not changed to a great extent since then. The information we give our readers here is, as are the maps and plans, from that invaluable Air Ministry publication, the "Air Pilot." Readers will thus be able to see at a glance the size, the facilities offered, and the other main features affecting the aerodromes from a flying point of view. It will be seen from the official list, which is also included in these pages, that there are 16 licensed municipal airports, while a further five towns have actually purchased sites. Of these latter the Municipality of Carlisle have already done sufficient work on their site to make it a usable landing ground.

MUNICIPAL AERODROMES PROGRESS

The position at the end of October

Towns which have Licensed Aerodromes (16)

Blackpool	Ipswich	Nottingham
Bristol	Leeds-Bradford	Plymouth
Cardiff	Liverpool (Speke)	Portsmouth
Hull	Manchester	Renfrew
Inverness	Norwich	Southampton
		Stoke-on-Trent

Towns which have Purchased Sites (5)

Carlisle	Leicester	Walsall
Doncaster	Southport	

Towns which have Reserved Sites in their Town Planning Schemes (8)

Basingstoke	Maidstone	Skegness
Blyth	Milton U.D.C.	Southwold
Burton	Rotherham	

Towns which have had Sites Inspected (94)

Abergavenny	Colchester	Huyton	St. Albans
Aberystwyth	Crewe	Irvine	Scarborough
Aberdeen	Cromer	Isle of Man	Sheffield
Aldershot	Derby	Kidderminster	Slough
Aylesbury	Dundee	Leek	Southend
Barnet	Eastbourne	Littlehampton	South Shields
Barnsley	Edinburgh	Lincoln	Stirling
Bath	Exeter	Lytham St. Annes	Stratford
Bedford	Falkirk	Middlesbrough	Swansea
Belfast	Gateshead	Middleton	Taunton
Bexhill	Glasgow	Motherwell	Tynemouth
Birkenhead	Grantham	Morecambe	Walthamstow
Birmingham	Greenock	Newcastle	Weymouth
Bognor	Grimsby	Newport (Mon)	Winchester
Bournemouth	Gt. Yarmouth	Newton Abbot	Windermere
Bridlington	Guildford	Northampton	Woking
Brighton-Worthing	Halifax	Northam, Devon	Warrington
Burnley	Harrogate	Peterborough	West Bromwich
Cambridge	Harwich	Poole	Warwick
Cheltenham	Hastings	Ramsgate - Margate-Broadstairs	Wellingborough
Gloucester	Hereford	Redditch	West Hartlepool
Chester	Huddersfield	Rochester	Wolverhampton
Chorley	Huntingdon		Worcester

Towns which have Displayed Interest in Aerodromes other than Above (65)

Airdrie	Hamilton	Reading
Axbridge	Haywards Heath	Redruth
Bangor	Haverford West	Rochdale
Barrow	Henley	Rugby
Bideford	Kendal	Salisbury
Bolton	Kingston	Shrewsbury
Buckie	Lancaster	Stafford
Burry Port	Llandrindod Wells	Sunderland
Cannock	Loughborough	Swindon
Caerphilly	Luton	Thornton, Lancs.
Chesterfield	Mablethorpe	Truro
Colwyn Bay	Merthyr	Wadebridge U.D.C.
Coventry	Montrose	Walton-on-Naze
Dagenham	Neath	Wallasey
Darlington	Newtownards	Watford
Dornoch	Nuneaton	Weston-super-Mare
Dover	North Berwick	Wigton U.D.C.
Dunfermline	Oxford	Wrexham
Durham	Perth	Winsford
Folkestone	Pontypridd	Witney
Gillingham	Preston	Yeovil
Gravesend	Pwllheli	

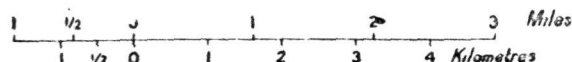
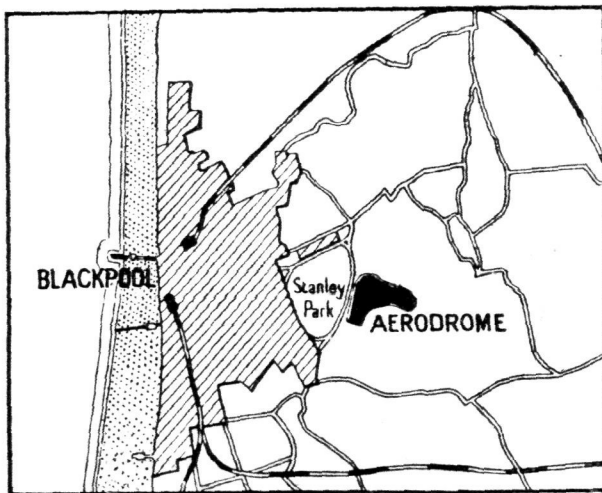


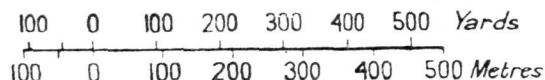
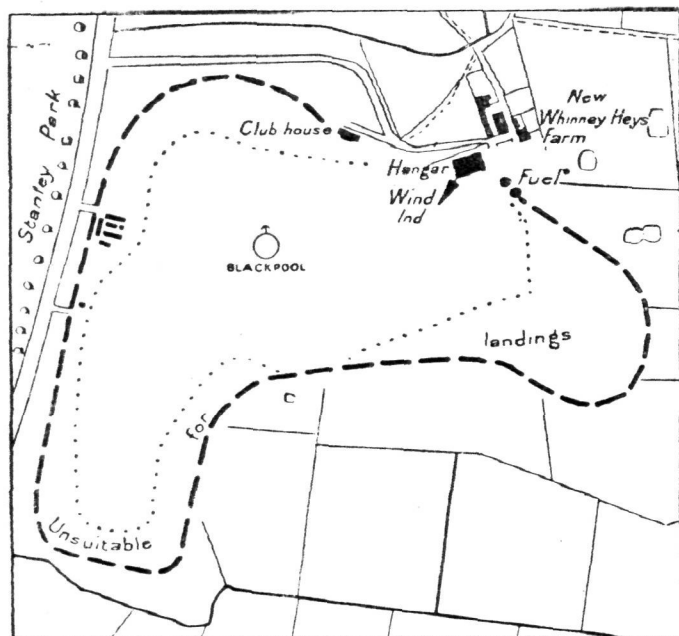
This map shows how our municipal airports are distributed.

BLACKPOOL (STANLEY PARK) AERODROME

STANLEY PARK AERODROME is situated 1½ miles East by South from the foot of North Pier, Blackpool, and immediately east of Stanley Park on the east outskirts of Blackpool. It is a fully licensed municipal airport for public use, and is operated by the Blackpool Corporation.

The surrounding country is gently undulating, with small cultivated grass fields bordered by hedges. There are many ponds, but it is, in general, fairly suitable for emergency landing grounds. A public park and an inhabited area are situated to the west. Flying instruction is given by the Blackpool and Fylde Aero Club.

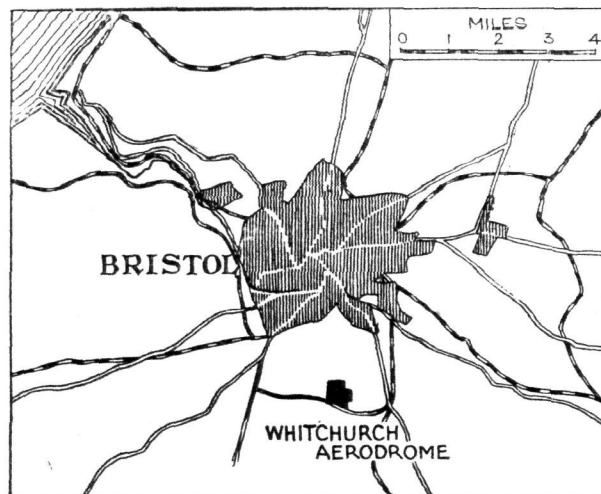




A prominent landmark by day is the steel lattice tower of Blackpool, 520 feet high, situated on the sea front. The dimensions of the landing area are: 500 yards from north to south, 700 yards from north-east to south-west, 650 yards from east to west, and 450 yards from south-east to north-west. The aerodrome is a flat, well-drained, grass-covered clay surface, slightly sloping to the South. There are no obstructions on any of its sides with the exception of a low wire fence on the eastern boundary. The name "Blackpool," with a landing circle in which an arrowhead indicates the true north, is marked in white near the centre of the aerodrome. A fairly large hangar, 120 feet wide, is available, there is a club-house, with a restaurant, on the aerodrome, a ground engineer is in attendance and minor repairs can be undertaken on the spot. Supplies of fuel, oil and fresh water are available. The town of Blackpool itself is only $2\frac{1}{2}$ miles distant, and an omnibus service from a point some 300 yards away from the aerodrome. A regular air service is maintained by a private firm between the aerodrome and the Isle of Man during the summer, and Customs facilities are available upon request. The telephone number of the aerodrome is Blackpool 3102. Meteorological reports can be obtained from Sealand aerodrome.

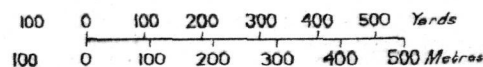
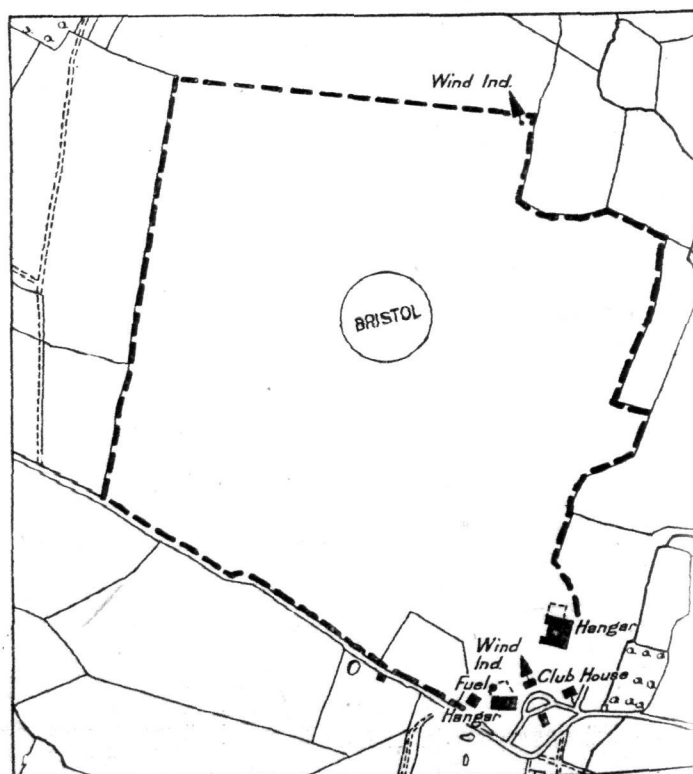
BRISTOL (WHITCHURCH) AERODROME

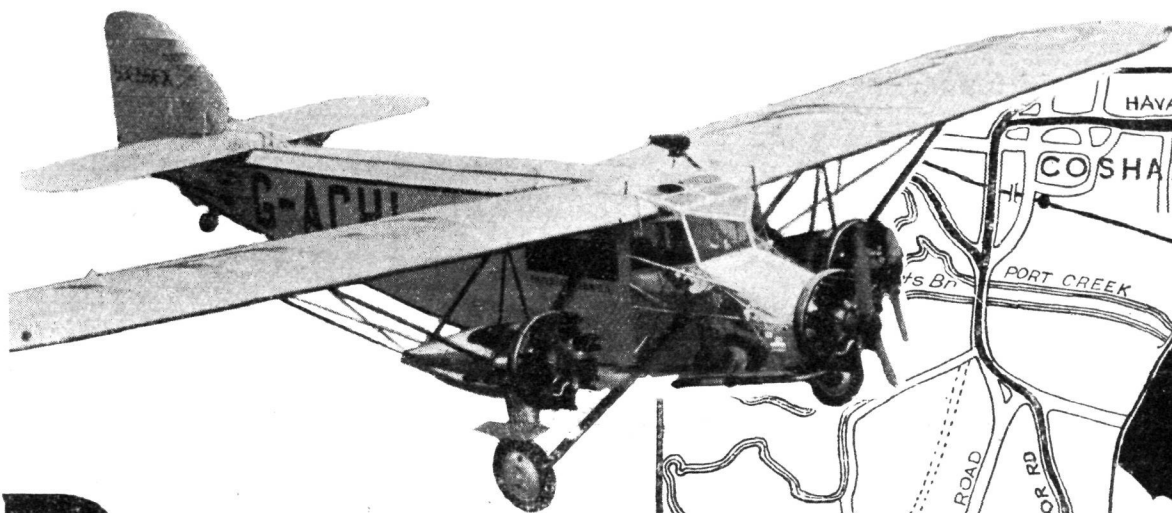
BRISTOL Airport is situated 3 miles due south of Bristol and 1 mile west-north-west of Whitchurch, and is some 290 acres in extent. It is a fully licensed municipal aerodrome for public use, and is operated by the Bristol Corporation. The Bristol and Wessex Aeroplane Club act as managers of the airport on behalf of the Bristol Corporation. The surrounding country is hilly to the south, with small grass fields. A prominent landmark by day is Dundry Church on a high hill, $2\frac{1}{2}$ miles west-south-west of the aerodrome. The airport is scheduled for Customs clearance, and also equipped for night flying. Two hours' notice is usually sufficient to ensure the attendance of a Customs Officer. A similar length of notice is also sufficient when night flying equipment is required, though this can be brought into use in a shorter time in cases of emergency. Air taxis are available at any hour for long or short journeys, and a regular service operates between Bristol and Cardiff. The dimensions of the landing area are: 960 yards from north to south, 950 yards from north-east to south-west, 880 yards from east to west, and 900 yards from south-



BRISTOL: A new arterial road runs to Whitchurch Aerodrome, placing Bristol within a few minutes' drive.

east to north-west. The aerodrome is a flat, well-drained, grass-covered clay surface. It is bordered by a 6-feet hedge and 5-feet chestnut paling on the north and east sides, a 5-feet hedge and fence on the south, and a 6-feet hedge on the west, and in the south-east corner are hangars and buildings 35 feet high. The name "Bristol" surrounded by a circle is marked in white near the centre of the aerodrome. Two hangars, 120 feet wide, are available. Ground engineers are in attendance and all repairs and engine overhauls can be executed. Supplies of fuel oil and fresh water are available. The club-house of the Bristol and Wessex Aeroplane Club, which includes a restaurant, is open to users of the aerodrome. Hourly meteorological reports covering the whole of the country are received as broadcasted from Heston Airport. The City of Bristol is three miles distant, and an omnibus service runs from Whitchurch to Bristol, while a new arterial road brings the aerodrome within ten minutes of the city centre; furthermore, the City and Avonmouth docks are less than half an hour's journey away. The telephone numbers of the aerodrome are Bristol 41165 and Whitchurch 411361.





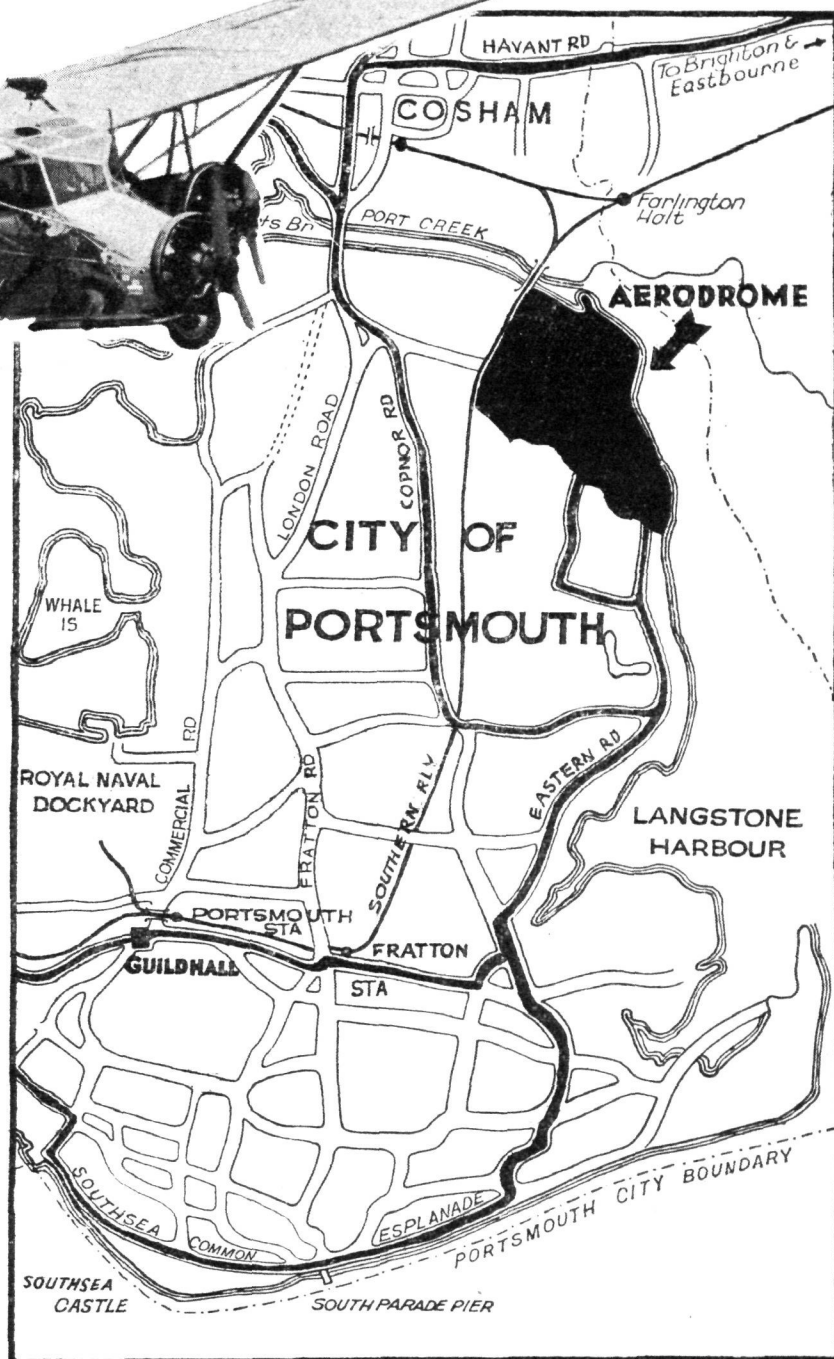
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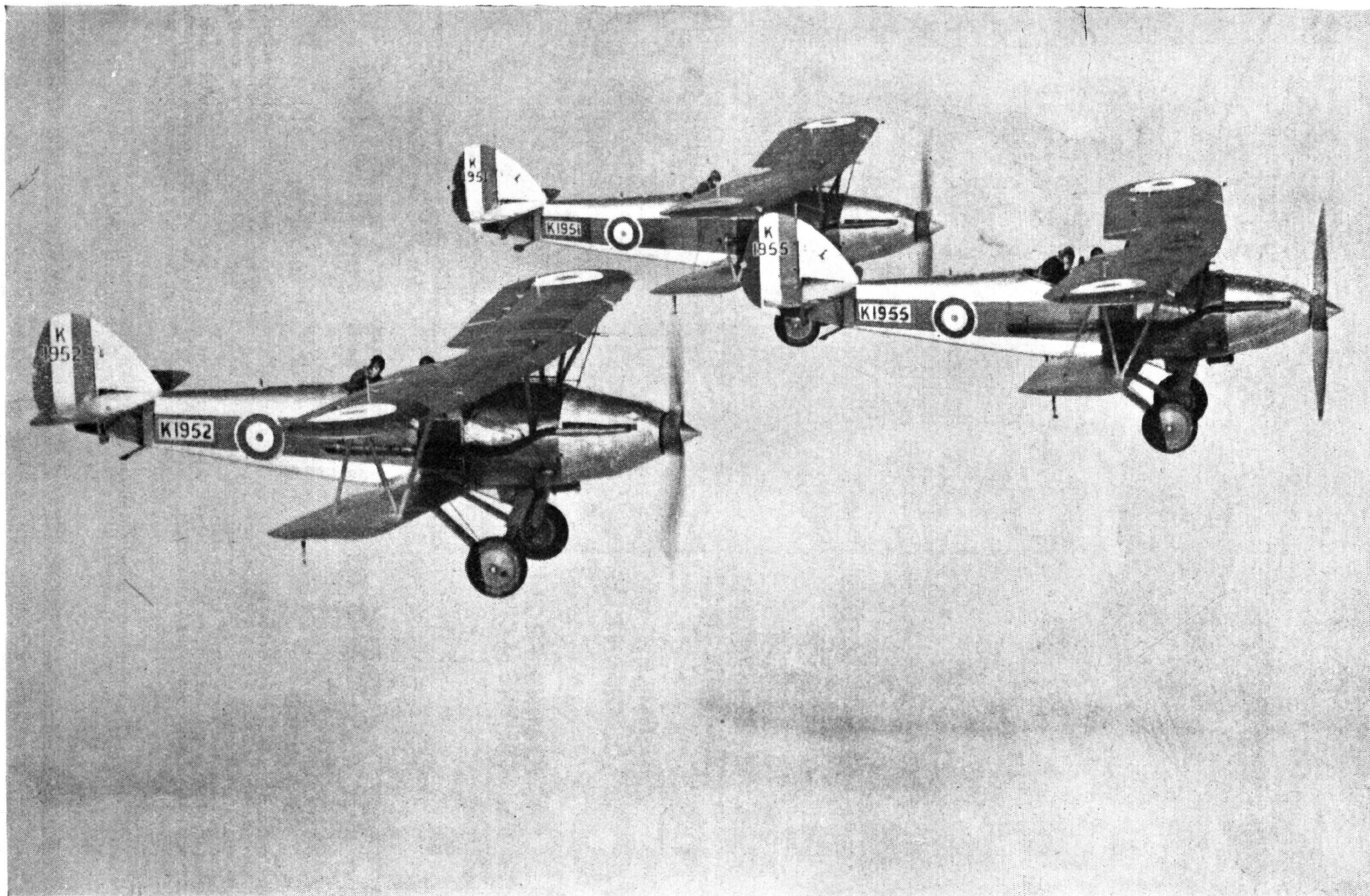
The scheme for the future extension of the Airport provides for ample hangar accommodation, factory sites, showrooms, staff cottages, garages, wireless control station and terminal building. It is also felt that with the advantages offered by the close proximity of such a sheltered sea space as Langstone Harbour, the airport's future as a commercial seaplane base may be as great as that of any aerodrome.

INDUSTRY

With its vast expanse of landing ground and its fine approaches, the Aerodrome is particularly suitable for the establishment of Industries and Manufactories connected with aviation, and already one firm of aircraft constructors have built a factory there. The proximity of the railway and the magnificent approach roads enhance its industrial possibilities. The Corporation are prepared to let factory sites adjoining the landing ground on favourable terms.

All information regarding facilities at the Aerodrome and the factory sites that are available will gladly be supplied by The Town Clerk, The Guildhall, Portsmouth.

Save time by using the Air Mail.

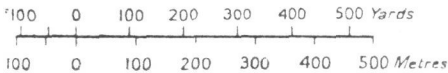
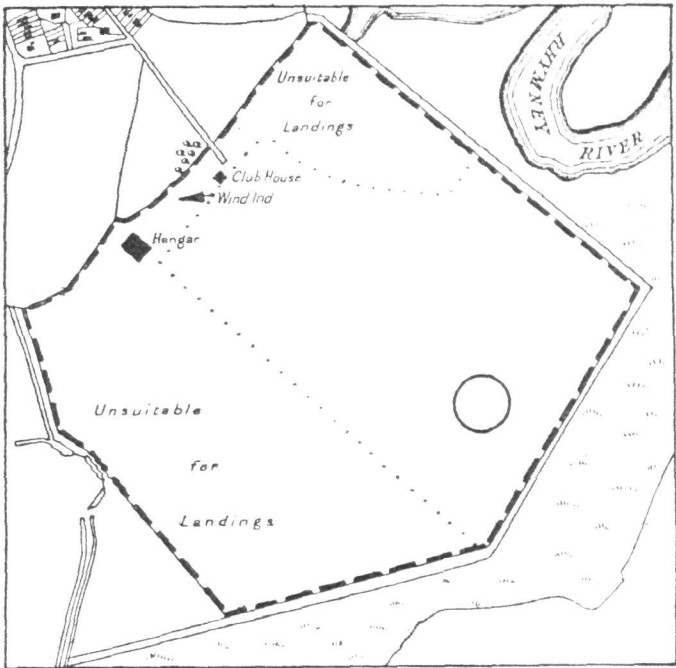
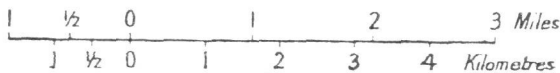
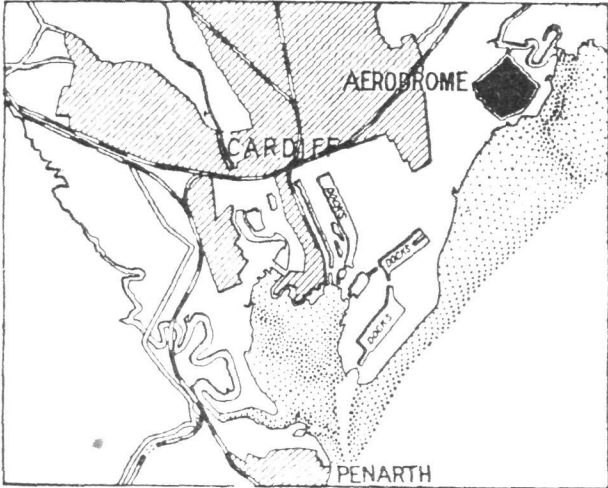


TWO-SEATER FIGHTER EXERCISES: One flight of No. 23 (Fighter) Squadron in Hawker "Demos" (Rolls-Royce "Kestrel").
(*"Flight" Photo.*)

Advt.

CARDIFF (PENGAM MOORS) AERODROME

THIS aerodrome, which is situated only 2 miles east of the centre of Cardiff, and 1½ miles south of Rumney, is a fully licensed aerodrome, available for public use. The owners are the Cardiff Corporation, and the aerodrome is operated by the Cardiff Aeroplane Club. The country around is flat and open to the north-west and north-east, and in the immediate vicinity of the aerodrome, while the Bristol Channel lies to the east and south. The landing area is 600 yards from north to south, 450 yards from north-east to south-west, 630 yards from east to west and 600 yards from south-east to north-west. The surface is a level, well-drained, grass-covered one. On the north-east, south-west and south sides the aerodrome is bounded by a 6-feet high sea wall. On the west and north-west side there is a fence, also 6 feet high, and on the latter side there are a few trees about 25 feet high. There is one han-

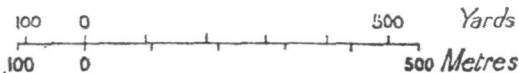
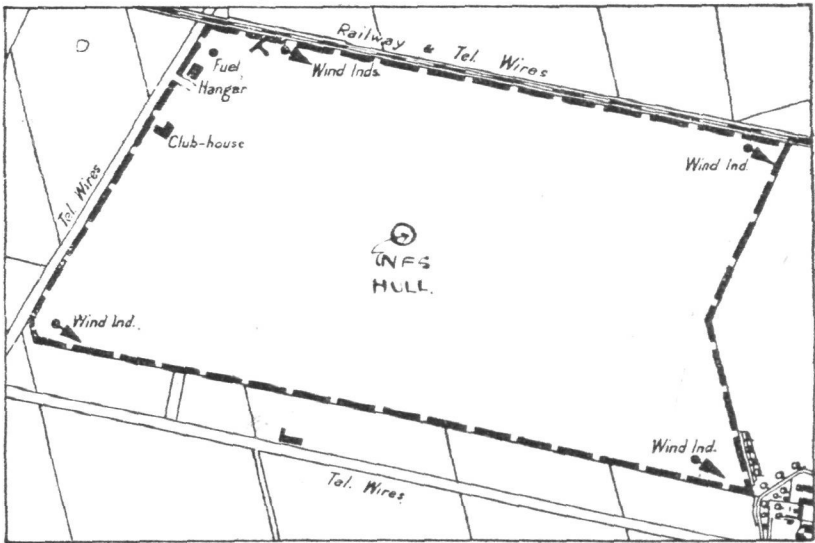
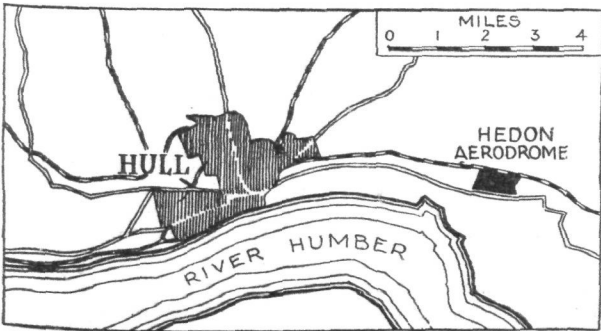


gar on the aerodrome, with a total door width of 80 feet. There is a clubhouse for refreshments and the ground engineer in attendance can effect minor repairs to visiting aeroplanes. Fuel, oil and fresh water are also available. Tram and motor-coach services run to Cardiff from a point three-quarters of a mile from the aerodrome. The telephone number of the aerodrome is Cardiff 1894.

Regular air services operated from this aerodrome include the Bristol-Cardiff service and the summer service between Birmingham-Cardiff-Teignmouth and Plymouth.

HULL (HEDON) AERODROME

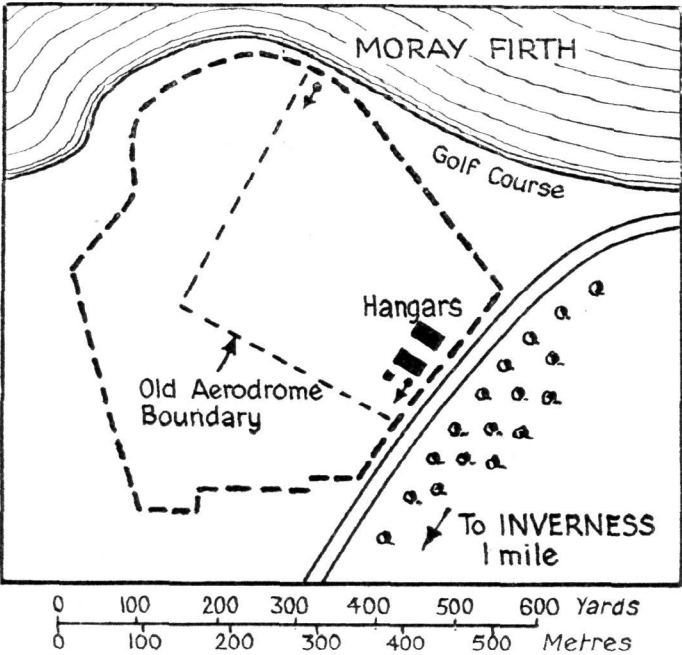
HULL municipal aerodrome is controlled by National Flying Services, Ltd., on behalf of the Hull Corporation. It is five miles east of Hull, one mile west by north of Hedon, and between the main road and the railway. Being situated close to the north bank of the River Humber, that river forms a very good landmark. The landing area itself is 520 yards from north to south, 600 yards from north-east to south-west, 1,000 yards from east to west, and 900 yards from south-east to north-west. On the north side the telegraph wires running along the railway are 29 feet high, and there are five railway signal posts from 30 to 40 feet high. In the north-east corner there is a small wood, with trees 35 feet high, 70 yards from the edge of the aerodrome. In the south-east corner there is a small wood, where the trees reach 60 feet high. On the south side telegraph wires run along the road at a height of 24 feet, and there is a house 31 feet high in the centre of the boundary. In the north-west corner, where there is a hangar and club-house, trees should also be noted about 50 feet high. The aerodrome markings consist of the word "Hull," and a white circle surrounding the letters "N.F.S." For accommodation of aeroplanes



there is one hangar with a door width of 40 feet. The clubhouse at the aerodrome is the well-appointed N.F.S. type, at which all conveniences are to be found. Minor aircraft repairs can be undertaken and supplies of fuel, oil and water are available. Hedon Railway Station is two miles away. Omnibus services to Hull, Hedon and Withernsea pass the aerodrome, while taxis can be obtained at fifteen minutes' notice. The telephone number is Hull Central 6933. It should be noted that aircraft are not allowed to fly at an altitude of less than 1,000 feet over the Saltend Chemical Works, which lies one mile south-west by south of the aerodrome.

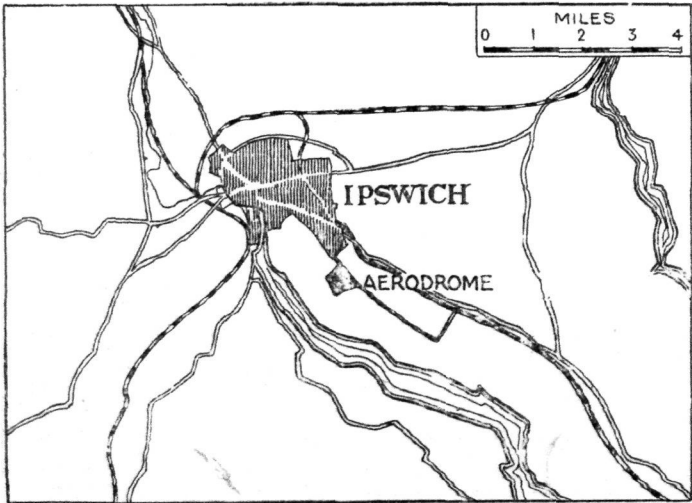
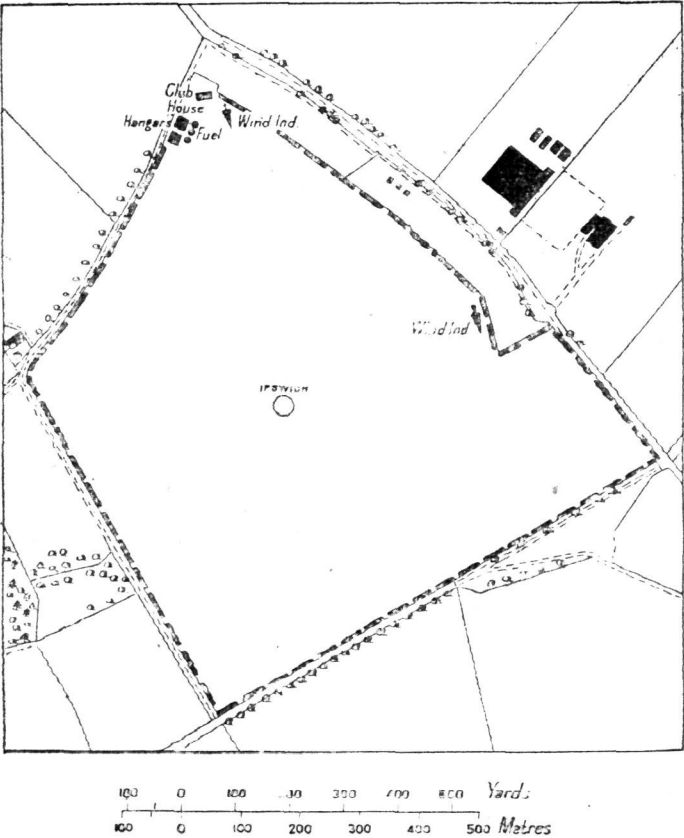
INVERNESS AIRPORT

THE airport belonging to the Inverness Town Council, which was opened early this year, is the only municipal airport north of Renfrew. Highland Airways, Ltd., are responsible for the aerodrome organisation, and that company also operates regular air services to Thurso and Kirkwall. It is a fully licensed airport and is immediately north of Inverness and south of the Moray Firth. Except to the east, the surrounding country is hilly. The surface is excellent, being grass covered on a sandy sub-soil and is therefore well drained. Telephone wires follow the road leading past the south-east boundary, but abreast the aerodrome have been sunk below the surface. Hangars, two in number, which, however, are not large enough to accommodate visiting aircraft, are placed about the middle of the south-east side of the aerodrome. The landing area is 450 yards from north to south and 400 yards from east to west, after certain extensions which are in hand are completed, it will be 600 yards and 560 yards respectively. Inverness railway station is approximately one mile away. The telephone number of the airport is Inverness 8, and a qualified ground engineer is always in attendance.



IPSWICH AERODROME

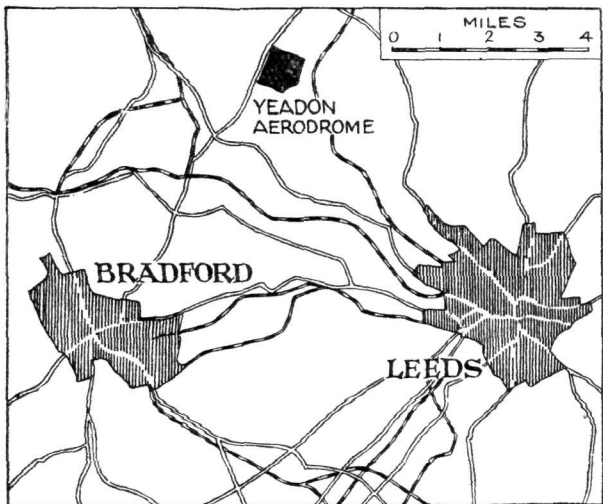
IPSWICH has a licensed municipal aerodrome, which is controlled by the Suffolk and Eastern Counties Aeroplane Club on behalf of the Ipswich Corporation. Its position is 2½ miles south-east of Ipswich and on the south-west side of the Ipswich-Nacton Road. There are two factory chimneys, 300 and 200 feet high, 250 yards distant from the north-east boundary of the aerodrome, which form excellent landmarks. An inhabited area lies to the north-west of the aerodrome, but, otherwise, the surrounding country is agricultural or heath land, with medium-sized fields fairly suitable for emergency landings. The size of the landing area is 1,050 yards from north to south, 830 yards from north-east to south-west, 950 yards east to west, and 850 yards from south-east to north-west. The surface is good and is grass covered on a sand and gravel subsoil. Apart from the two factory chimneys already mentioned, there are few obstructions. Trees from 20-60 feet high lie along the north-east side, as well as an electric cable, 30 feet high, running along a road. On the south-east, south-west and north-west side there are a few trees 40-50 feet high. Sheep, when grazed on the area, are in charge of a shepherd. A landing circle and the name "Ipswich" are marked in white chalk in the centre of the aerodrome. Two hangars, each with a door width of 32 feet, form the accommodation for aircraft, and ground engineers are in attendance, while fuel, oil and fresh water are available. An omnibus service runs to Ipswich itself from a point ¼ mile away from the aerodrome. The telephone number is Ipswich 3294. Meteorological reports may be obtained from Felixstowe seaplane station.



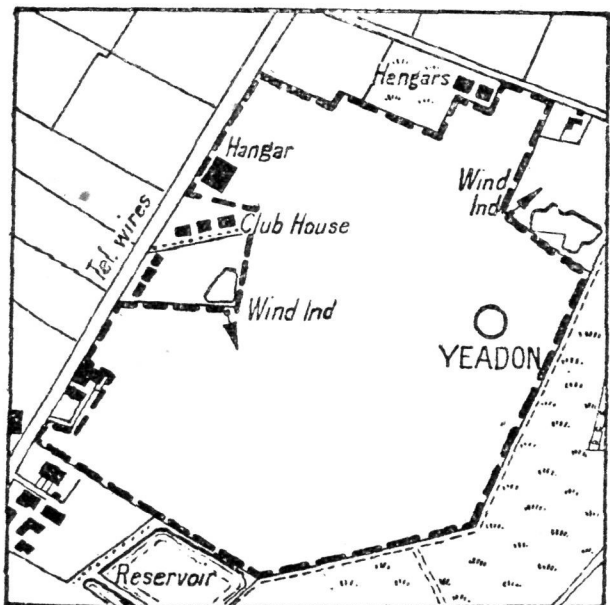
IPSWICH : This municipal aerodrome is close to the town and so shortens business men's trips.

LEEDS-BRADFORD (YEADON) AERODROME

YEADON is a licensed civil aerodrome operated by National Flying Services, Ltd., on behalf of the Bradford and Leeds Corporations. It is situated seven miles north-west of Leeds, six miles north-north-east of Bradford and three-quarters of a mile east of Yeadon. The surrounding country is very hilly and undulating, with small grass fields, and is therefore generally unsuitable for emergency landings. The main dimensions are 600 yards from north to south, 760 yards from north-east to south-west, 550 yards from east to west and 660 yards from south-east to north-west. It stands fairly high, the mean altitude above sea level being 653 feet. The surface is flat, well drained and grass covered. Two hangars, with a door width of 35 feet, reach a height of 30 feet, and are situated on the north side. On the south side a small hill should be noted about 60 feet high and some 500 yards distant from the aerodrome boundary. In the south-west corner there are farm buildings 30 feet



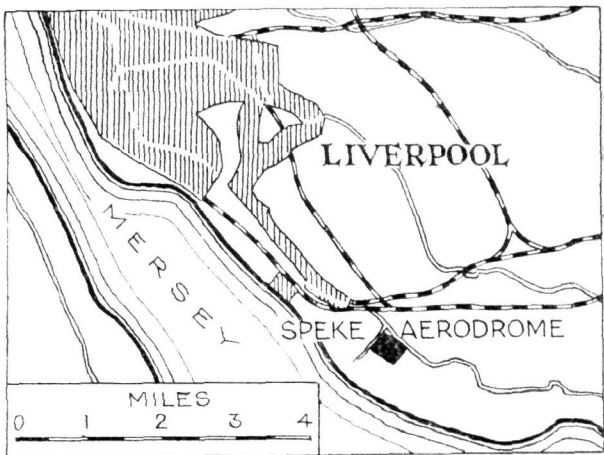
YEADON : At a distance of only 7 miles from Leeds and 6 from Bradford, with good road connections, Yeadon forms an excellent municipal aerodrome for both these cities.



high and a chimney 100 feet high, a quarter of a mile away. On the west side houses and telegraph wires reach a height of 25 feet, while there is also another hangar 30 feet high. The name "Yeadon" and a landing circle are marked in white in the eastern portion of the landing area. The Yorkshire Aeroplane Club uses the aerodrome and has its club-house at which refreshments can be obtained, on the north-western side. Telephone Rawdon 134 and 165. Ground engineers are in attendance and minor repairs can be executed at the aerodrome. Supplies of fuel, oil and water are available. An omnibus service passes the aerodrome and a car may be obtained at short notice.

LIVERPOOL (SPEKE) AIRPORT

THIS civil landing ground is controlled by the City of Liverpool. It is six miles south-east of the centre of the city, three-quarters of a mile south-east of Garston and three-quarters of a mile west of Speke Village, and is situated on the banks of the River Mersey. The landing ground at present available comprises 920 yards from north to south; 1,200 yards north-east to south-west; 1,400 yards east to west, and 1,050 yards south-east to north-west. Obstructions are very few indeed; there



LIVERPOOL : On the banks of the Mersey, Speke is a potential Transatlantic flying-boat station.

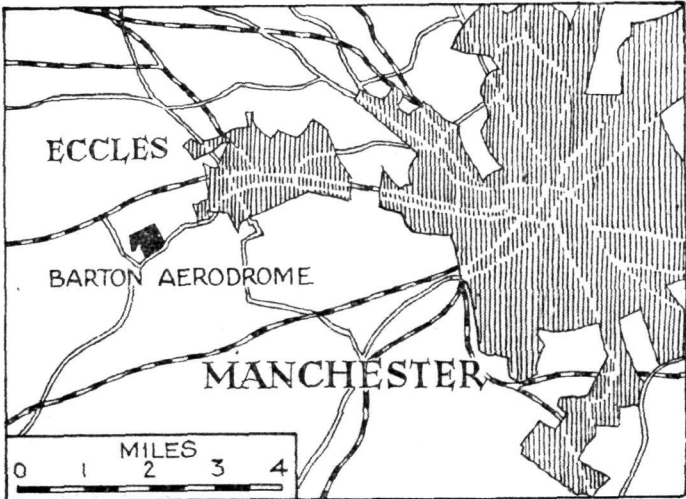
are some trees about 40 feet high on the north-east and north-west sides and buildings and trees on the southerly side. The roads across the landing ground do not constitute any obstruction to aircraft taxiing or landing. The name "Liverpool" is within a landing circle 150 feet diameter. Refuelling pumps are installed and oil and fresh water available. The workshop is equipped for small repairs and normal maintenance is available.

Airport control offices include Customs arrangements for aircraft carrying passengers and light baggage only. Prior notification is required for attendance of Customs officer, normal notice being 24 hours.

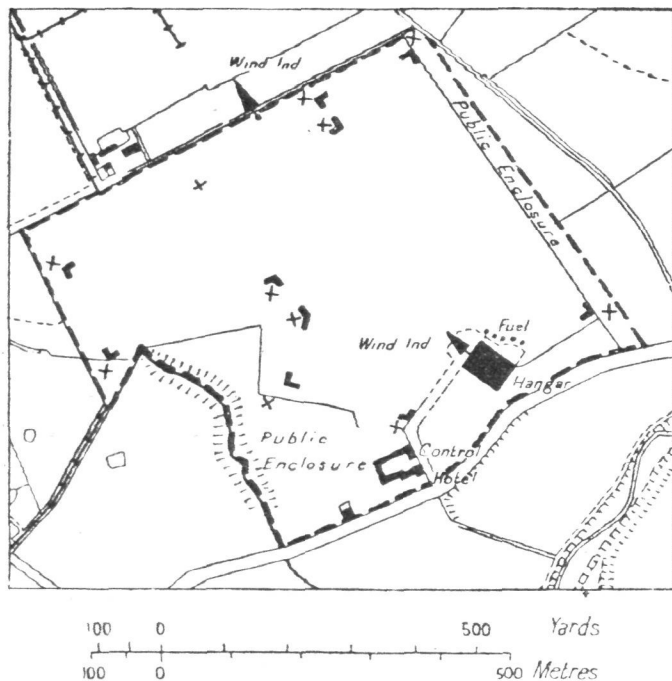
There is one steel hangar with a door width of 71 feet. First-aid appliances are available. The nearest doctor is at Garston. Omnibus service between Liverpool and the airport, within 150 yards of the airport gates, every 20 min. from 9 a.m. until 11 p.m. Refreshments at the airport offices. Garston railway station half a mile distant. Normal flying hours, sunrise to sunset, but on one hour's notice Money flares will be placed to form a landing light, the safe approach line and over-run being indicated by red hurricane lamps.

MANCHESTER (BARTON) AERODROME

MANCHESTER Airport is controlled on behalf of the Manchester Corporation by Airwork, Ltd., and a Customs Officer is in attendance when required. It lies 6 miles west of Manchester, 2 miles west-south-west of Eccles and immediately south-east of Barton Moss. The surroundings to the east are densely inhabited, but to the west the country is flat and somewhat wooded, with medium-sized fields. The landing area is 530 yards from north to south, 522 yards from north-east to south-west, 738 yards from east to west, 522 yards from south-east to north-west. The surface is composed of peat soil, fairly



MANCHESTER : Trams run from Manchester through Eccles to the aerodrome at Barton.

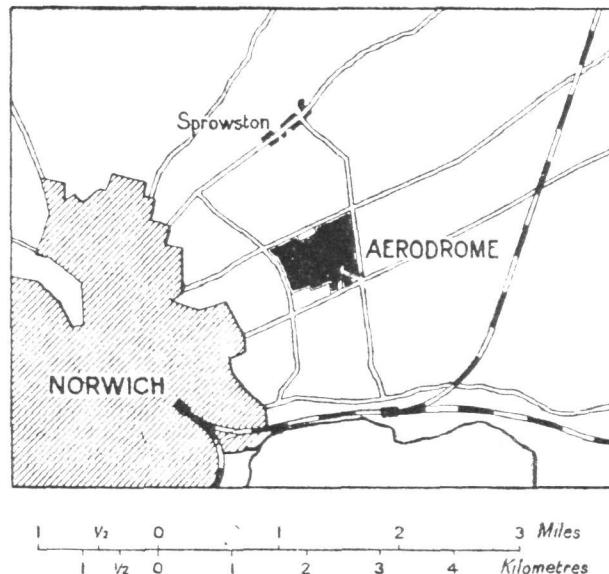


MANCHESTER : A modern airport serving the Midlands.

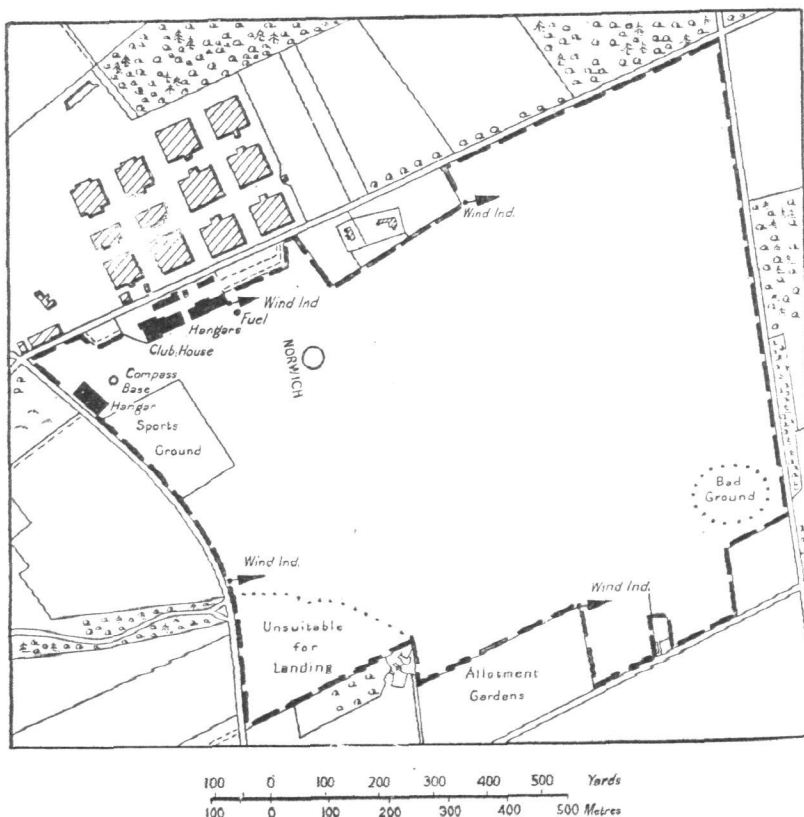
well drained and generally hard, but soft spots occur after continuous heavy rain on the south-east side. Apart from the hangar and buildings, which are about 30 feet high, there are three towers, 240 feet high, $\frac{3}{4}$ -mile from the boundary of the aerodrome. The name "Manchester" is painted in white letters each side of the hangar, which is a large one with a door width of 100 feet. There is an excellent hotel with sleeping accommodation at the aerodrome. The telephone number is Eccles 3592. All kinds of repairs are executed by Air-work, Ltd., and supplies of fuel, oil and fresh water are available. Excellent facilities for ground transport exist, and an omnibus service to Manchester, Warrington and Liverpool passes the aerodrome. Full meteorological and wireless service is provided.

NORWICH, MOUSEHOLD AERODROME

THIS aerodrome of 205 acres is controlled by the Norfolk and Norwich Aero Club for the City of Norwich. It lies two miles north-east by east of Norwich, one mile south by east of Sprowston and on the north side of the road to Little Plumstead. An inhabited area lies to the west, with hilly heath land immediately west, but medium-sized pasture fields generally suitable for emergency landing grounds form the majority of the surrounding country. The landing area is 700 yards from north to south, 1,100 yards from north-east to south-west, 900 yards from east to west, and 700 yards from south-east to north-west. Areas of bad ground exist in the south-east and south-west corners, which are indicated by means of white posts and red flags, but generally the grass covered surface is good, sloping slightly towards the north-east. On the west side there is a fenced-off sports ground 200 x 150 yards, and a hangar 35 feet high is near the north-west corner. Buildings and trees about 30 feet high lie along the north side. A landing circle and the name "Norwich" is marked in white chalk on the north-west portion of the aerodrome. There is one hangar available, which has a door width of 49 feet. Minor repairs can be undertaken at the aerodrome, and those of a major nature can be executed at the works of Boulton & Paul, Ltd., the well-known aircraft manufacturers, which are situated two miles distant by road from the aerodrome. Supplies of fuel, oil and fresh water are



available. An omnibus service to Norwich passes the aerodrome and Thorpe railway station lies two miles away. Excellent and spacious club premises with sleeping accommodation, a dining room where all meals can be obtained, and many other facilities have recently been opened on the aerodrome.



NOTTINGHAM (TOLLERTON) AERODROME

NOTTINGHAM'S fully licensed aerodrome at Tollerton, is operated by National Flying Services, Ltd., on behalf of the Nottingham Corporation, and is used by the Nottingham Flying Club. It is four miles south-east of Nottingham and three-quarters of a mile north-north-east of Tollerton. The landing area measures 675 yards from north to south, 900 yards from north-east to south-west, 800 yards from east to west, 650 yards from south-east to north-west. The surface is good and level and grass covered. It is well drained and slopes slightly towards the east. There are three ponds and a shed in the west portion of the aerodrome, but both these and

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<i>Alfred Hollison</i>	<i>J. Neville Stoddart</i>
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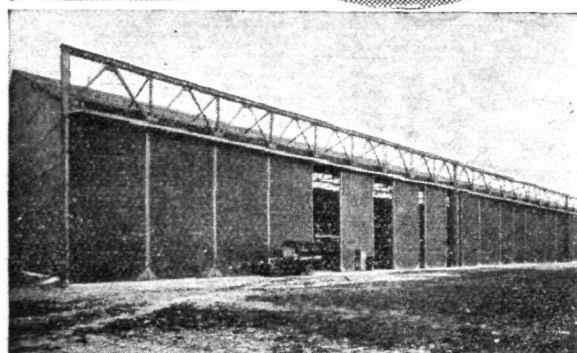


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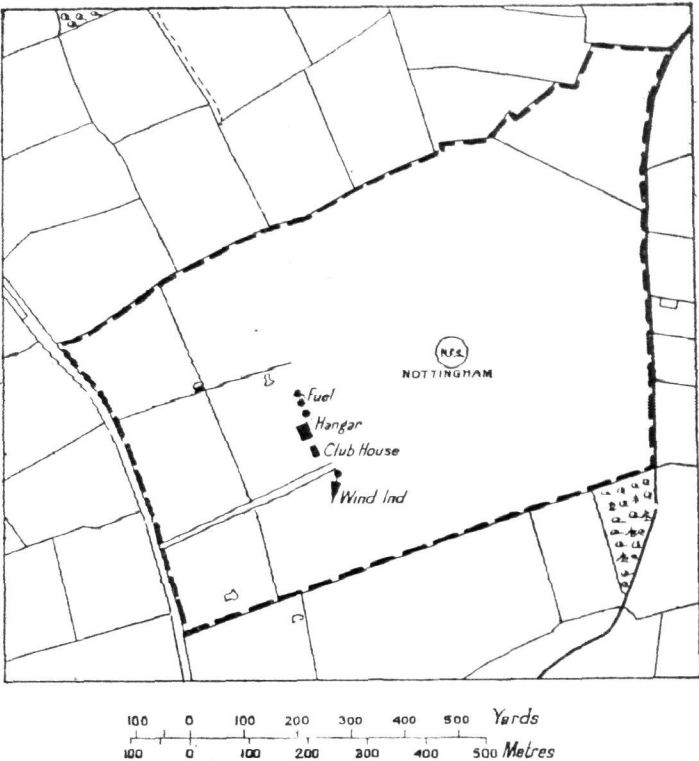
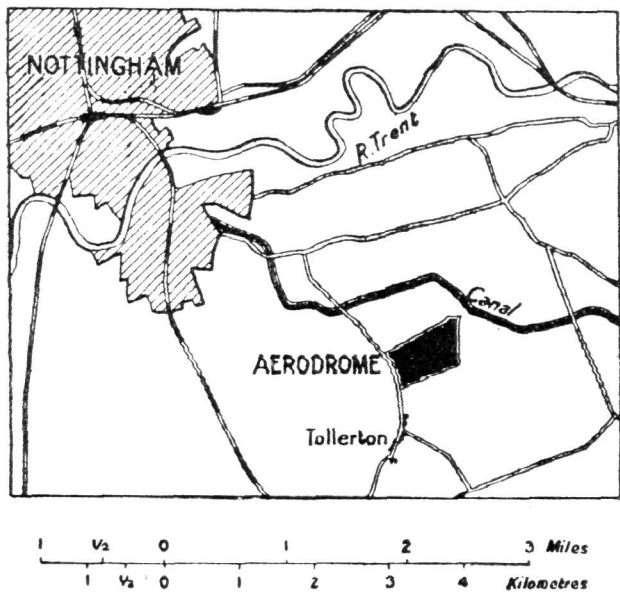


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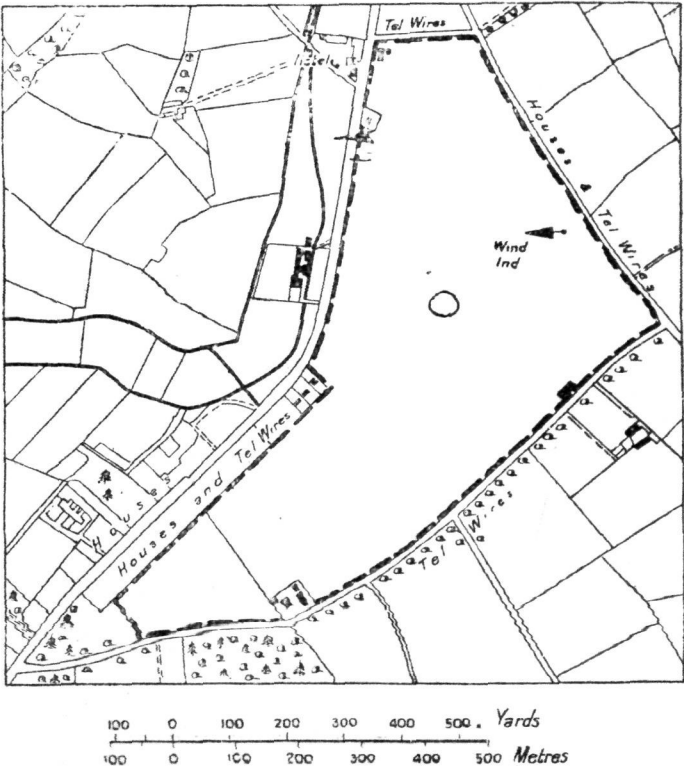
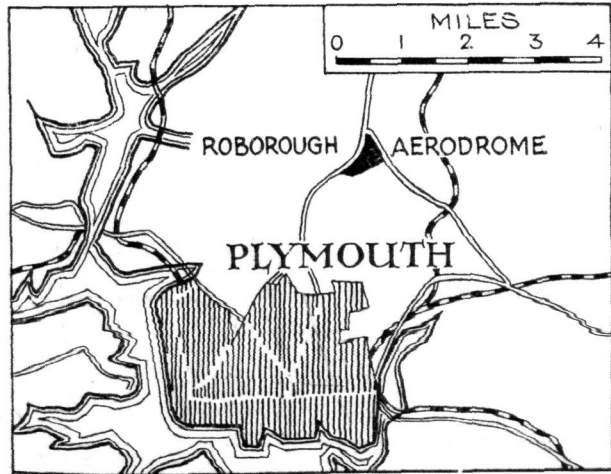
the north-east corner are divided from the landing area by hedges and are not available for use by aeroplanes. In the south-east corner there is a plantation of trees 30 feet high, while the aerodrome buildings, which also reach a height of 30 feet, lie on the west side. Telegraph wires run along a road 200 yards distant from this boundary. Apart from these there are no obstructions of any considerable height. The name "Nottingham" and a landing circle surrounding the "N.F.S." are marked in white concrete near the centre of the landing area. Hangar accommodation consists of one hangar with a door width of 60 feet. The club-house of the Nottingham Flying Club possesses a restaurant which is available to users of

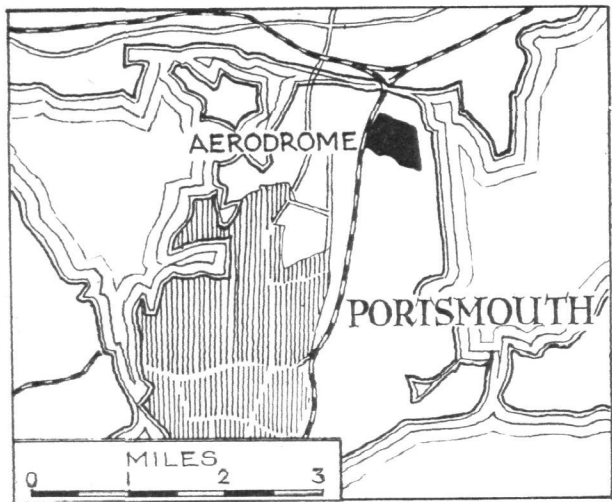
the aerodrome. Minor repairs can be executed in the workshops and a ground engineer is always in attendance. The usual supplies of fuel, oil and fresh water are available. An omnibus service to Nottingham passes the entrance to the aerodrome, and the telephone number of the club-house is: Plumtree 45 and 41 (hangar).

PLYMOUTH (ROBOROUGH) AERODROME

PLYMOUTH'S municipal landing ground is controlled by the Plymouth City Council. It lies $3\frac{3}{4}$ miles north-north-east of Plymouth, 2 miles east by south of Tamerton Foliot, and on the east side of the main road. The surrounding country is very hilly and wooded, with extensive tracks of moorland to the north-east, so it can hardly be called suitable for emergency landings. The dimensions of the landing area are 780 yards from north to south, 750 yards from north-east to south-west, 500 yards from east to west, and 500 yards from south-east to north-west. The subsoil is gravel, over which is a well drained grass covered surface. The landing area itself is slightly dome shaped. Along the north side there are telegraph wires 30 feet high, and a similar obstruction is to be found, together with houses of about the same height, on the north-east side. Along the south-east side, trees reach a height of 60 feet, below which are more telegraph wires 30 feet high, and the airport hangar 20 feet high. In the south-west corner there is a tree 85 feet high, and along the west side trees reach a height of 60 feet, below which again are more telegraph wires the

same height as before. It is worth noting that the north-east boundary of the Devonport prohibited area lies 2 miles south-west of the landing ground. The hangar is a fairly large one, with a door width of 82 feet. The George Hotel, an excellent hostelry of the old type, is the other side of the road on the north-west corner of the landing ground. Surrey Flying Services provide repair facilities, and supplies of fuel, oil and water can be obtained on the aerodrome. An omnibus service to Plymouth passes the landing ground. A telephone is available at the aerodrome, the number of which is: Crown Hill 349.





PORTSMOUTH AIRPORT

PORTSMOUTH possesses one of our largest municipal airports. It lies $2\frac{1}{2}$ miles north-east of the centre of the city in the north-east corner of Portsea Island and joining Langstone Harbour. To the north-west and south-west, therefore, the surrounding area is populated, and this, with the water-covered area of Langstone Harbour, does not leave anywhere adjacent to the aerodrome suitable for emergency landings. The landing area is, however, very large, the main dimensions being 780 yards from north to south, 700 yards from north-east to south-west, 980 yards from east to west and 1,325 yards from south-east to north-west. The surface is particularly good, level, well drained and grass covered. The only obstructions worthy of note are those on the south side, where the hangars and buildings are 60 feet high and two gasometers, each 140 feet high, together with several chimneys 100-130 feet high, which lie 350 yards beyond the boundary of the aerodrome. The north-east boundary of the Portsmouth prohibited area lies one mile south-west of the aerodrome. The aerodrome is marked with a landing circle and the name "Portsmouth" in concrete. There are two hangars, one large one, with a door width of 60 feet,

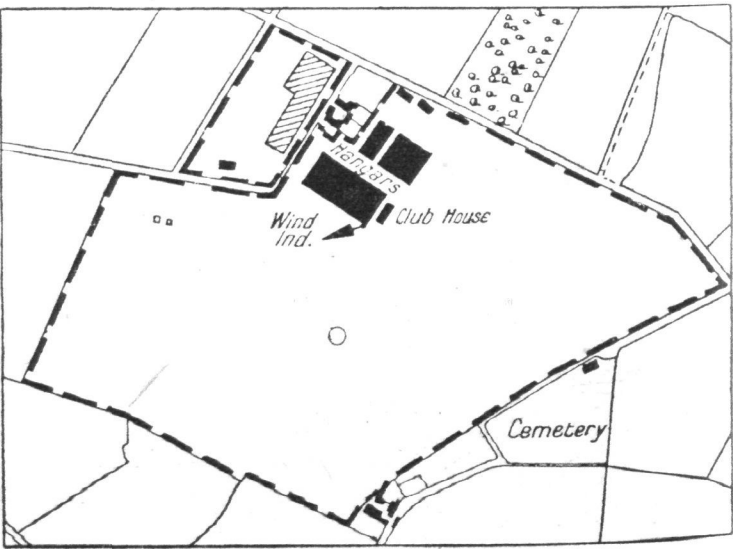
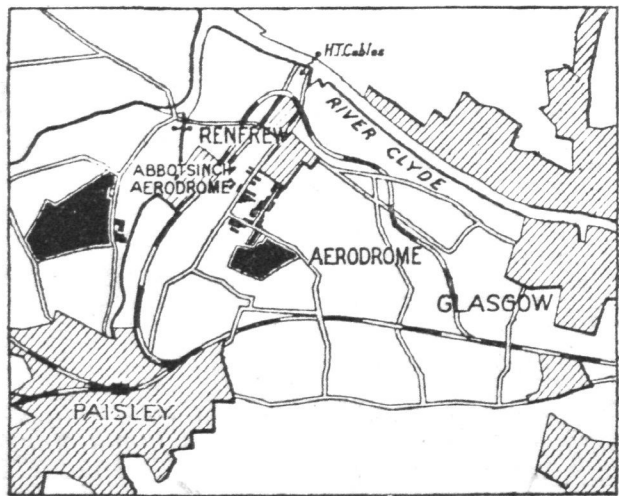


and one smaller one, of about 40 feet. There is a restaurant open during the whole of the year, and a converted farmhouse makes a delightful headquarters for the Portsmouth Aero Club. An omnibus service operates between the city and the aerodrome. The aerodrome is owned and controlled by the Portsmouth Corporation. The service company is the Portsmouth, Southsea & Isle of Wight Aviation, Ltd., which operates an air taxi service, the Spithead air ferry and other services. Airspeed, Ltd., aircraft constructors, have a large factory adjoining the landing ground on the south-east.

RENFREW AERODROME

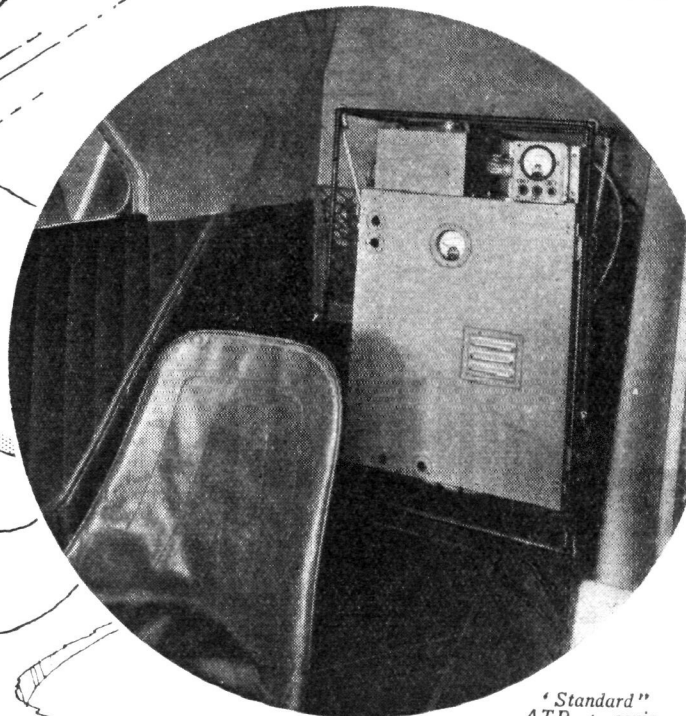
THE Scottish Flying Club operates the Renfrew aerodrome on behalf of the Royal Burgh of Renfrew. It is only five miles west by north of the city, $1\frac{1}{2}$ miles north-east of Paisley and one mile south by west of Renfrew. The size of the landing area is 500 yards from north to south, 650 yards from north-east to south-west, 950 yards from east to west, and 550 yards from south-east to north-west. The surface is fairly level, but there is a steep rise to a small knoll in the west portion, with a slight slope towards the east-south-east and south-west. The aerodrome

becomes soft in very wet weather. On the south-west side there is a tall chimney 140 feet high, 300 yards distant. High masts, bearing power cables, exist $1\frac{1}{2}$ miles north-west by north and $1\frac{3}{4}$ miles north by east from the aerodrome. There are three hangars, each with a door width of some 80 feet. All repairs can be executed at the aerodrome, while, of course, full supplies of fuel, oil and fresh water are available. Both the tramway and omnibus services approach within $\frac{1}{4}$ mile of the aerodrome. Telephone No.: Renfrew 191.



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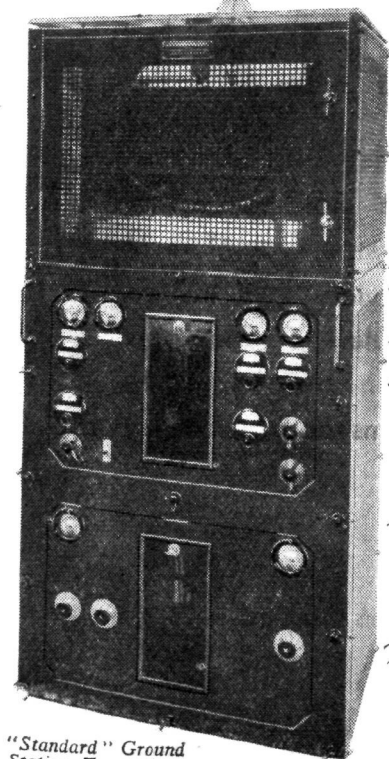
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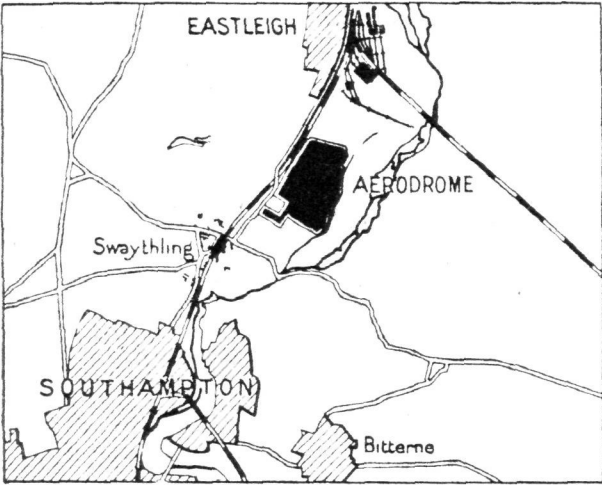
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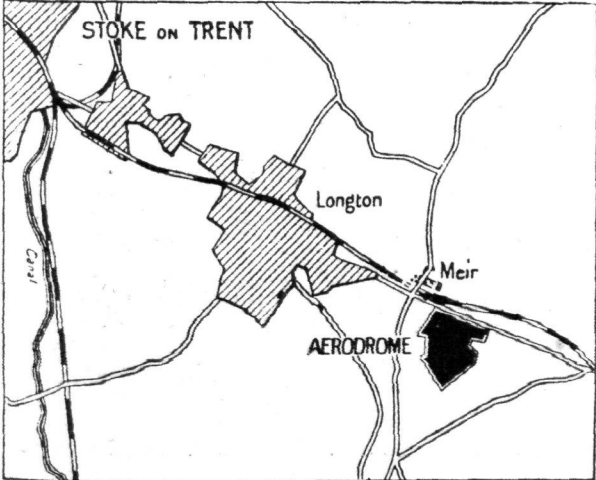
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SOUTHAMPTON (ATLANTIC PARK) AERODROME

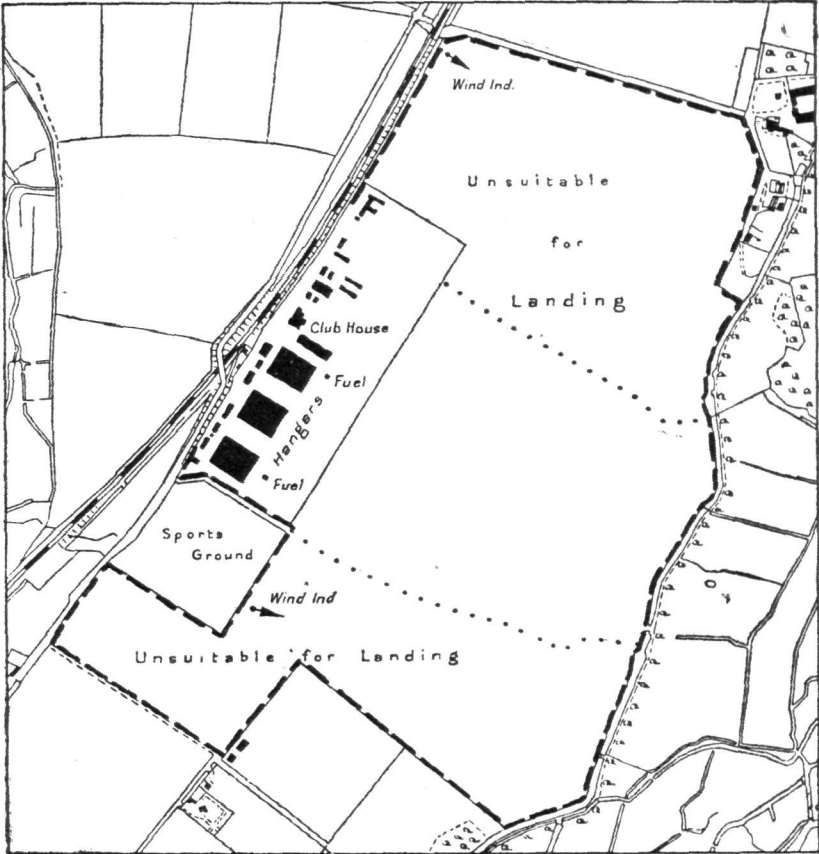
SOUTHAMPTON'S large municipal aerodrome is at Eastleigh, three miles north-north-east of Southampton, 1 1/2 miles south-south-west of Eastleigh railway station and 2/3 mile north-east of Swaythling railway station. This aerodrome, the home of the Hampshire Aeroplane Club, is also used by the Supermarine Aviation Works (Vickers), Ltd. It is situated in open country and has a good level grass-covered surface. Its main dimensions are: 1,450 yards from north to south, 600 yards from north-east to south-west, 700 yards from east to west and 800 yards from south-east to north-west. The obstructions are inconsiderable except on the west side, where the aerodrome buildings reach a maximum height of 35 feet. The hangars available for visitors are two in number and are both very large, being, as they are, of the type used by the Royal Flying Corps during the war. There is a club-house on the aerodrome at which the usual food and other amenities may be obtained (Telephone: Eastleigh 35 and 170). Minor repairs can be undertaken by the ground engineering staff, and the usual supplies of fuel, oil and fresh water are available. An omnibus service to Southampton passes the aerodrome entrance, and a tramway service stops one mile away.

STOKE-ON-TRENT (MEIR) AERODROME

THE controlling authority of Meir aerodrome is National Flying Services, Ltd., and the North Staffordshire Aero Club operate it on behalf of the Stoke-on-Trent Corporation. It lies 3 1/2 miles south-east of Stoke-on-Trent, 1 1/2 miles south-east of Longton and immediately south of the



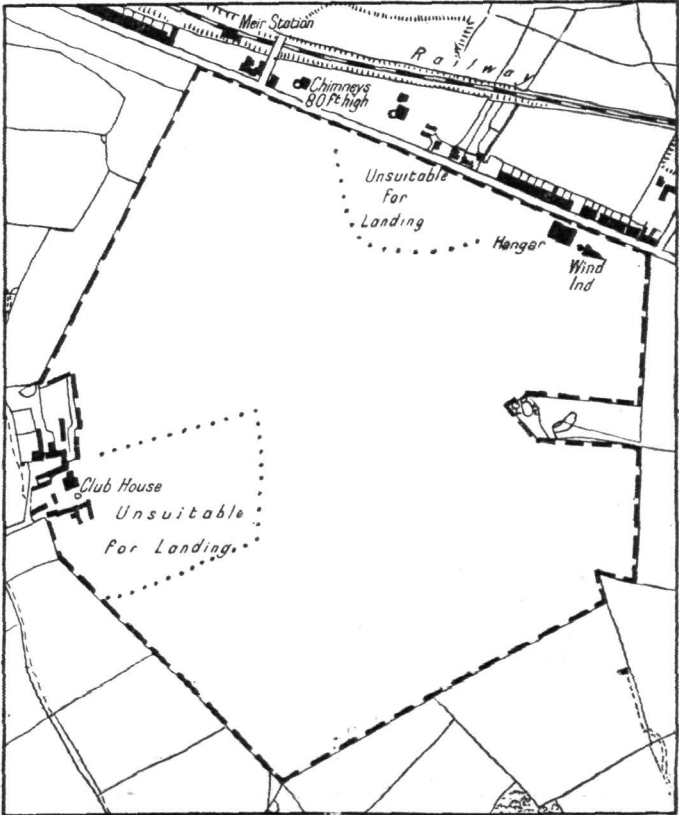
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100 0 100 200 300 400 500 Yards
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SOUTHAMPTON : A large aerodrome at Eastleigh.

Meir railway station. The aerodrome is in open country and particularly adapted as a refuge from the thick weather which so often prevails in the Pennine district. It is of ample size, measuring, as it does, 1,000 yards from north to south, 880 yards from north-east to south-west



100 0 500 Yards
100 0 500 Metres

975 yd. from east to west and 1,000 yd. from south-east to north-west. It is fairly high above sea level; its altitude being 620 ft. The surface, which is grass covered, is level, well drained and set on a gravel sub-soil. Except on the northern side, where telegraph wires 50 ft. high run along the road, and there are two chimneys 80-ft. high as well as a hangar 20-ft. high, there are no noteworthy obstructions. A pool adjoins the eastern boundary and is marked with white concrete slabs. The hangar has

a door width of 22 ft. and minor repairs can be executed by the ground engineering staff at the aerodrome. The club-house has a restaurant, at which users of the aerodrome can obtain food (Telephone: Blythbridge 122). The usual supplies of fuel, oil and fresh water are available, and as for local communications, Meir station, London, Midland & Scottish Railway, adjoins the aerodrome, and a frequent service of motor buses passes the main entrance.

BRITISH AIR ARMAMENT IN PARLIAMENT

AN important statement of British air policy was made in the House of Lords by Lord Londonderry, Secretary of State for Air, on November 29. The noble Marquess stated that Great Britain's policy was to have a One Power standard in the air. The Government were willing to agree to the complete abolition of all naval and military air forces, "provided only that there can be devised an effective scheme for the international control of civil aviation which will prevent all possibility of the misuse of civil aircraft for military purposes." They must, however, abandon the policy of unilateral disarmament, which was not only useless, but even dangerous for us to pursue further.

Another, but very confused, debate also took place in the House of Commons, Mr. Baldwin saying that he had not the slightest idea of what Lord Londonderry had said in the Lords. He said that the Government were striving for peace by agreement, or rather for disarmament which would make war more difficult, because peace ultimately was a matter of will and not of armaments. He said that we could not remain indefinitely as we were.

The debate in the Lords was initiated by the Duke of Sutherland, who reviewed the situation, and recommended an increase in the Auxiliary Air Force. Lord Lloyd supported him, while Lord Ponsonby deprecated any increase of our air forces. Lord Londonderry said that a race in armaments must be avoided at all costs. It would be a disaster of the first magnitude if an agreement were not reached on a definite limitation of armaments. He gave figures of various air strengths, Great Britain having about 850 military aeroplanes, France 1,650, and he believed, but could not be certain, that Russia had about 1,300 to

1,500, the United States between 1,000 and 1,100, and Italy between 1,000 and 1,100. The United States was about to make a substantial increase in air strength; so was Japan. The Russian Minister of War had announced that the Soviet Government intended to proceed with an increase of air strength in the publicly expressed belief that that Power which was strongest in the air was strongest all round. Great Britain's armed strength had always been thrown into the scales on the side of peace. The appropriate steps to ensure that the British Empire was at least as strong in the air as any other great nation were now under examination by His Majesty's Government, who had made parity in the air, as at sea, one of the most important points of their policy. He should not hesitate, if necessary, to propose such concrete measures as were necessary to implement that policy. It was quite impossible for us to continue a policy of unilateral disarmament.

In the House of Commons, Admiral Sueter started the debate with a motion on "the present inadequacy of the provision made for the air defence of these islands." An amendment was moved by Wing Com. James (C.) supporting the British Draft Convention. After a rather confused debate, Mr. Baldwin said that he was afraid of the effect on the disarmament negotiations still in progress if the House of Commons seemed to vote for an increase of armaments.

Mr. Baldwin also said that the coming Estimates for the Defence Services would be examined on the basis of the united defence of the country.

The amendment was carried, and then the motion as amended was also carried.

The G.A.P.A.N. Installation Ceremony and Presentation to J. A. Mollison

SQD. LDR. THE HON. F. E. GUEST was installed as Master of the Guild of Air Pilots and Air Navigators of the British Empire, and Mr. O. P. Jones was installed as Deputy Master, at the installation ceremony held in the Skinners' Hall on Monday, December 4. After the ceremony the Johnston Memorial Trophy, which is awarded annually by the Guild for the best feat of navigation by a civil pilot during the year, and which was instituted in memory of Sqd. Ldr. E. L. Johnston, was presented to Mr. J. A. Mollison in recognition of his flight across the North Atlantic in 1932. It will be remembered that Sqd. Ldr. Johnston was largely responsible for founding the Guild, and was killed while serving as navigating officer in *R.101*. The following were elected as Wardens:—The Marquess of Clydesdale, G. M. Cox, N. Macmillan, A. G. Lamplugh and R. Stocken, and the following as new members of the Court of the Guild: J. B. Allen, F. T. Digby, R. A. de Haga Haig, R. C. Preston, P. E. Phillips and J. H. Rodney.

The Prince of Wales and wireless

HIS ROYAL HIGHNESS THE PRINCE OF WALES, in proposing the toast of "The Radio Industry" at the annual banquet of the Radio Manufacturers' Association at the Savoy Hotel on Monday, November 27, emphasised the value of wireless to flying. To quote his own words, "As one who likes to look upon the air as his main means of travel, I am first to appreciate the value of radio in flying. I have a set in each of my two machines, and it may amuse Sir John Reith to hear that it takes us nearly half an hour to get outside of his wonderful music before we can get anything we really want to hear." His Royal Highness also made a reference to television.

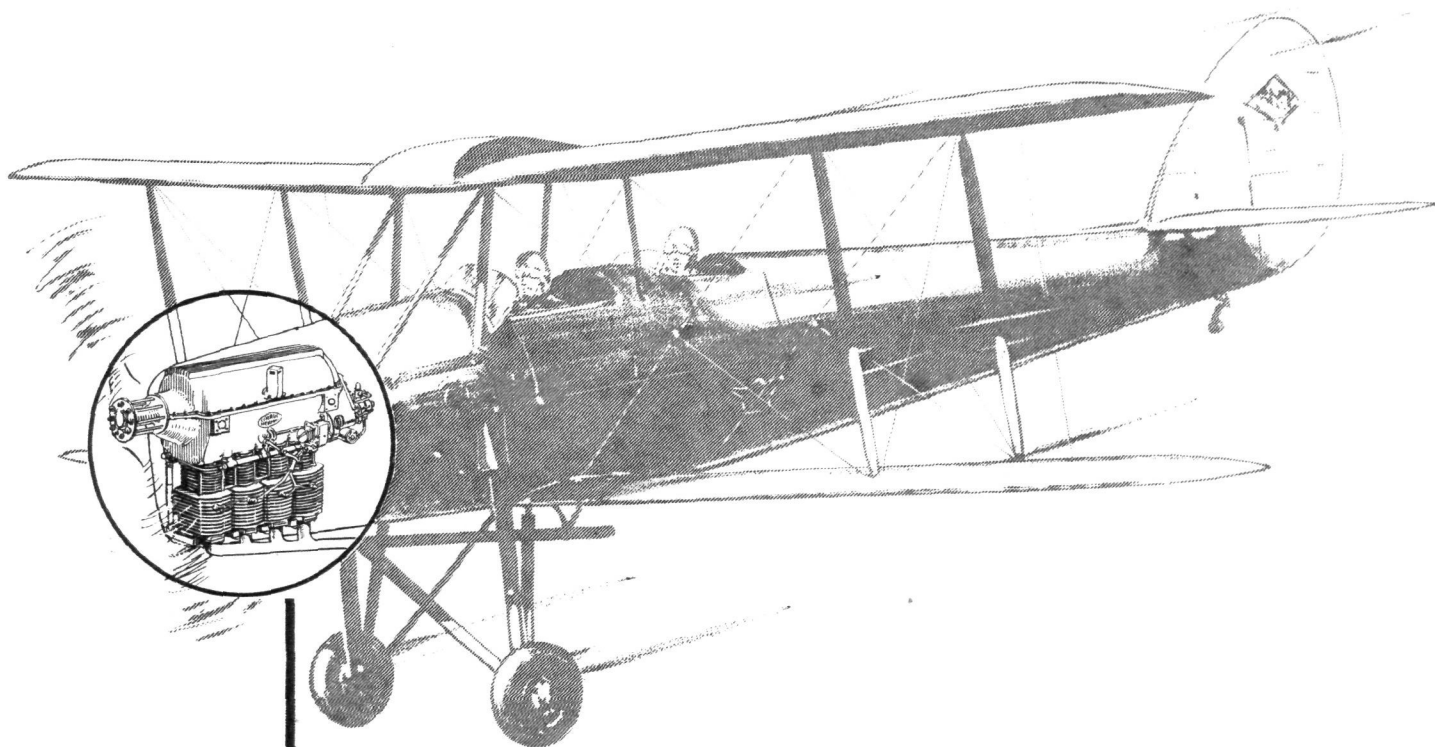
Airman's body recovered

A BODY, which has been identified as that of Sergt. John William Eric Christian, pilot of the R.A.F. machine which disappeared off Hartlepool on September 26, was washed up at Clacton on Wednesday, November 29.



LOOKING BACK : This picture of J. A. Mollison—who has just been presented with the Johnston Memorial Trophy—was taken just before he started on one of his early record flights on his "Gipsy Moth."

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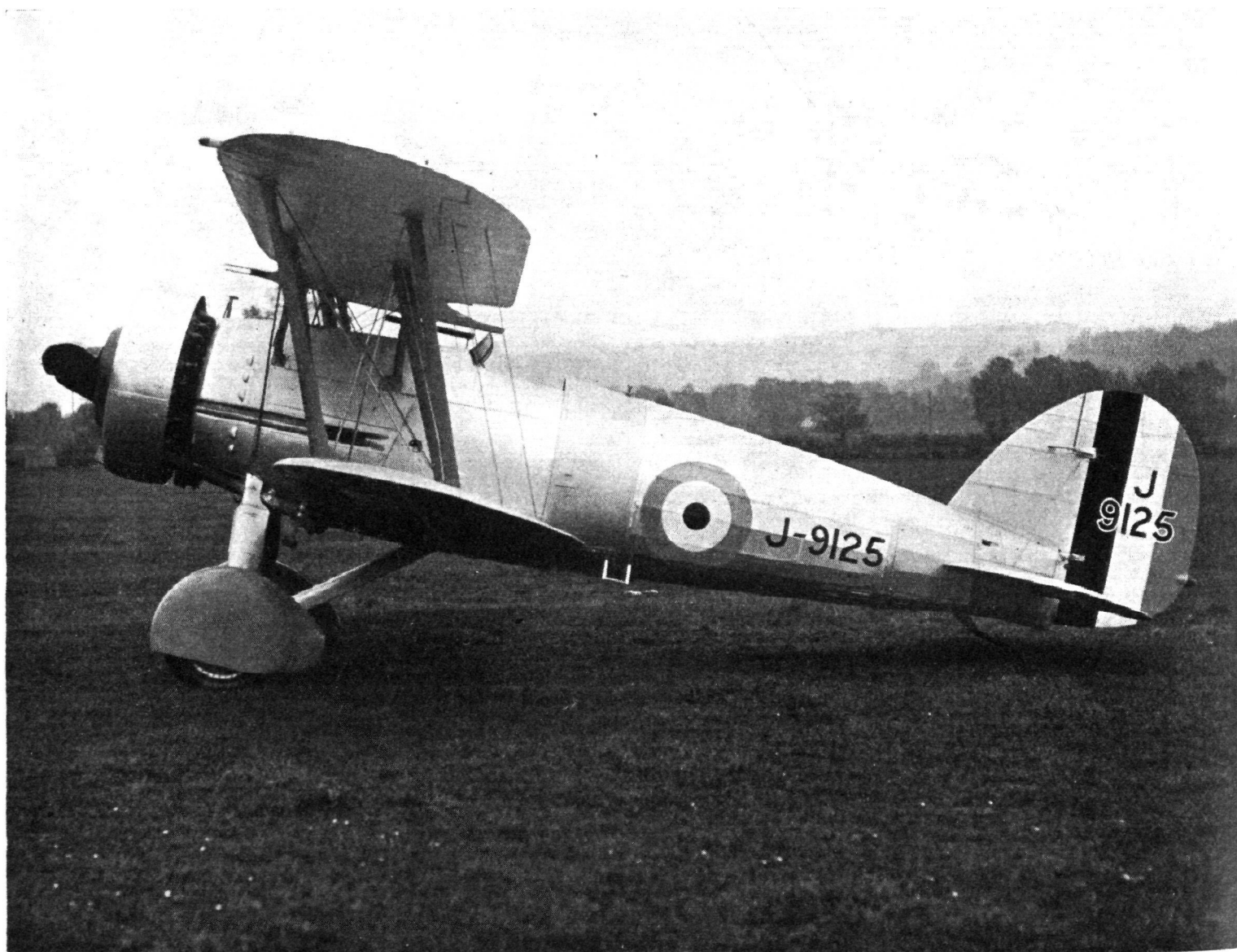
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Air Transport & Commerce

CIVIL FLYING IN AUSTRALIA

Report for 1931, 1932 and 1933 to Sept. 30

FROM time to time we have published articles on civil flying in Australia, which from the flying point of view is one of the most interesting countries in the world. A complete survey of the whole subject up to the end of September last is contained in an excellent report just issued by the Civil Aviation Branch of the Department of Defence. In general the story told is of how the flying movement in the Commonwealth passed through the time of the great depression and weathered it, and now is starting on a new career of progress, helped by a Government which has always shown itself wise and long-sighted in its care of civil flying. The report remarks that "the fact that the reduced spending power of the business community has not led to serious decrease (in traffic figures) indicates that the advantages of air travel are being increasingly recognised."

Throughout the period under review there has been no extension or curtailment of the subsidised services, and they have maintained their standard of safety and regularity. These subsidised services are:—

West Australian Airways.—(a) Perth-Adelaide, with Vickers "Viastras" (two "Jupiters"); (b) Perth-Derby, and (during the dry season of eight months) Derby-Wyndham, with D.H. 50, "Giant Moth" and "Dragon."

Q.A.N.T.A.S.—(a) Brisbane-Camooweal; (b) Cloncurry-Normanton; (c) Daly Waters-Birdum during the four months of wet weather. The machines used on these services are the "Giant Moth" ("Jupiter") and the D.H. 50J ("Jupiter").

Larkin Aircraft Supply, Ltd.—Camooweal-Daly Waters,



Sketch map showing the regular air transport services in operation in Australia.

using the "Lascoter" ("Nimbus") and the "Lascondor" (three "Mongoose III").

During 1932 these services flew 564,693 machine miles and carried 3,074 passengers, mainly through outback districts, and 28,621 lb. of mails. There were no accidents which involved death or injury.

In addition to these subsidised services there were several unsubsidised services, some of which carried mails on payment of so much per lb., and others which carried only passengers and goods. Some of these services were hard hit by the depression, and some, notably Australian National Airways, had to suspend operations. Five companies of the mail-carrying class have survived, and two of the last-named class. The following are the routes of the unsubsidised services:—

MAIL CARRYING

(Tasmania):—

Melbourne-Launceston
Tasmanian Aerial Services, Ltd.,
using "Fox Moths" and
Desoutters.

Hart Aircraft Co., Ltd., using
Avro 10.

Matthews Aviation Pty., Ltd.,
using Saro "Windhover."

Brisbane-Sydney:—

New England Airways, Ltd.,
using Avro 10.

The Matthews Company flies
from Melbourne to Tasmania via
King Island, and the other two



THE AVRO X: The machine shown was originally in service on the air routes operated by Australian National Airways, but is now operated by the Hart Aircraft Co. on the Melbourne-Launceston service.

firms via Flinders Island. The three services between them provide an almost daily link across the Bass Strait. The steady growth of traffic on the Sydney-Brisbane route is described in the report as "remarkable."

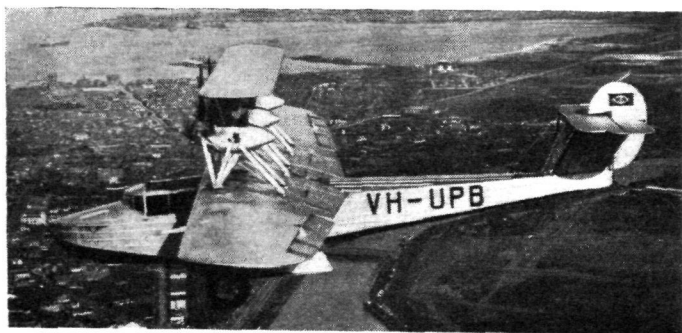
SERVICES WHICH DO NOT CARRY MAILS

Brisbane-Rockhampton:—Rockhampton Aerial Services, Ltd., using D.H. 50.

Adelaide-Port Pirie:—Commercial Aviation Co., using Fokker "Universal."

The contracts for the existing subsidised services are nearing their expiry date, and when the new scheme comes into force the whole situation will be changed. The following routes will be established:—Darwin-Singapore, 2,333 miles; Darwin-Charleville-Brisbane, 2,028 miles; Charleville-Cootamundra, 629 miles; Katherine-Perth, 2,252 miles; Melbourne-Hobart, via King Island, 475 miles; Cloncurry-Normanton, 215 miles; Ord River-Wyndham, 158 miles. All these services will be operated once weekly in each direction. Their aggregate route mileage will be about 8,090 miles, which exceeds the length of the present subsidised services by over 2,500 miles.

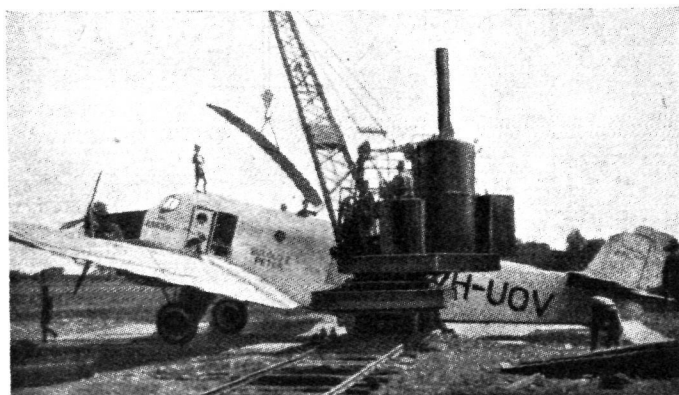
The report remarks that the internal services which have



AN AMPHIBIAN: The Saro "Windhover" amphibian flying-boat, which is used by the Matthews Aviation Service on their Tasmanian service.

approached the maximum traffic which can be expected from the sparsely settled districts they serve will receive the benefit of the overseas traffic, and the added traffic should result in lower subsidy costs to the Government. "Further, the advantages of the accelerated mail service with European and other countries could well result, within a reasonable time, in a revenue to the Government sufficient to cover the cost of the overseas service, and thereafter to contribute materially towards the cost of the internal services. This fact appears to have been ignored by those who would have this important and promising service left to others to establish."

In addition to the extensions of subsidised services, the



IN NEW GUINEA: One of the Junkers G.31 heavy freight monoplanes (three "Hornets") used by Guinea Airways, Ltd., for transporting mining machinery, etc., to the Bulolo goldfields.

Government has allocated a special grant of £3,000 to be distributed by the Defence Minister in assisting concerns to establish and maintain services of any nature that are of direct benefit to the community.

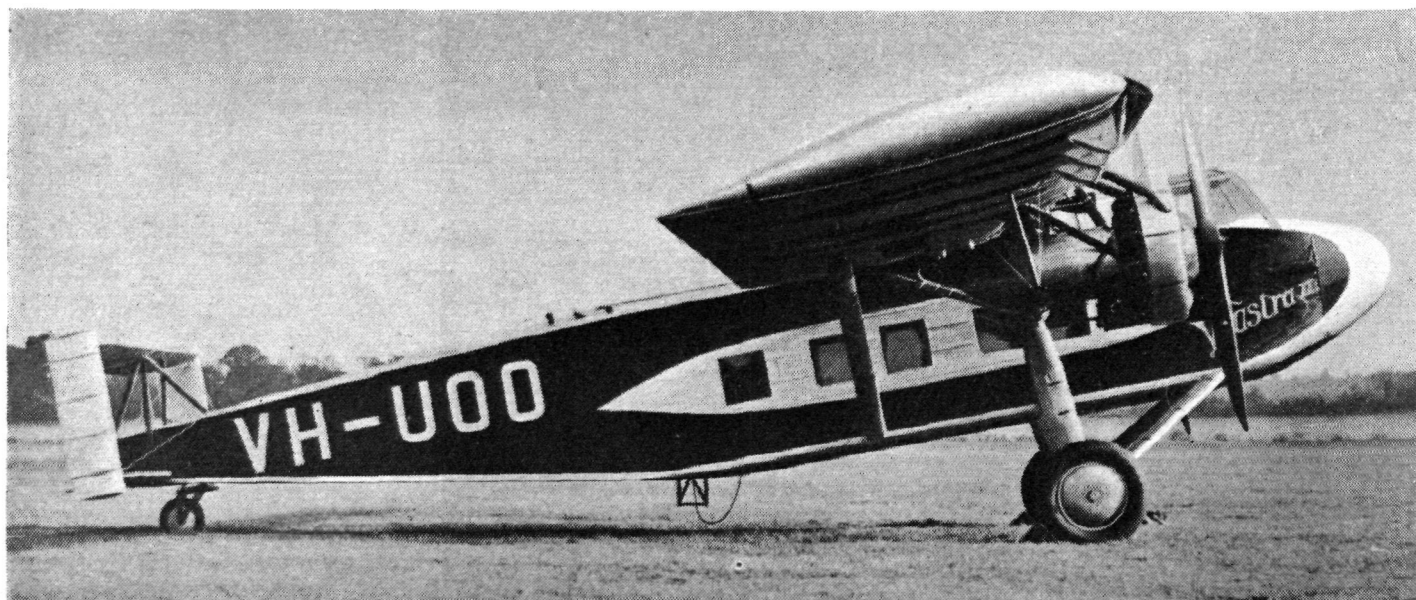
As regards the flying clubs, the agreements with all of them expired recently, but it is pleasing to record that the Government, appreciating the excellent work of these bodies, has decided to extend assistance to them for a further period of three years.

Private training organisations, feeling the full force of the depression, applied to the Government for help, but the Government decided to refuse it. The £3,000 mentioned above is intended to encourage firms to enter into spheres of activity of more direct benefit to the community.

There has been a pleasing growth in the number of landing grounds in Australia, but the number is still far short of that needed to enable wide use to be made of aircraft on taxi flights. Many important towns still are without municipal aerodromes. The Government has acquired or leased some 183 landing grounds for civil purposes. Others are being got ready in preparation for the new service.

The first section of the report ends with a remark which seems to admonish some of the critics of the Government's programme. "Decisions vital to the future of civil aviation in the Commonwealth have been made after most careful consideration, and the stage is now being set for various developments of far-reaching importance. All can contribute to make these projects a success, but little notice should be taken of those who seek only to destroy when others would build."

"Perhaps," remarks the report, "the most remarkable feature in Australian air transport in recent years has been the extraordinary increase in the tonnage of freight



SUBSIDISED: One of the Vickers "Viastras" (two "Jupiters") used by West Australian Airways on the Perth-Adelaide service.

conveyed by air services operating in the Mandated Territory of New Guinea." It is indeed extraordinary. Four companies are now at work conveying freight to the goldfields, namely, Guinea Airways, Ltd., Pacific Aerial Transport, Ltd., Holden's Air Transport Services, Ltd., and W. R. Carpenter & Co. Guinea Airways is the oldest company, which started work in 1927 with two D.H. machines. It now has ten machines of various sizes at work, seven of which are Junkers, while the other two are a "Moth" and a Westland "Widgeon." In 1930, 3,007,807 lb. of freight were carried to the goldfields by air, and in 1932 the total pounds carried amounted to 8,802,706. A letter from an eminent international mining engineer who had no connection with any of the companies operating, but who visited the goldfields in 1932, is quoted. He wrote:—"My outstanding impression is one of amazement at the efficiency and adequacy of the service, completely overshadowing any analogous accomplishment I have seen or known of in any other part of the world. I have heard no adverse comment

whatever from any source, while praise has been unstinted."

None of the aircraft companies at work in New Guinea is subsidised by the Government. The local Administration, however, awards annual contracts for conveying Administration passengers and freight between the coast and the goldfields. The 1933-34 contract has been awarded to Holden's Air Transport Services. The Administration is now considering the invitation of tenders for a seaplane service to carry Administration officials between Rabaul and other ports in the Territory.

The Minister for Defence recently approved the appointment of an inter-departmental committee to report on the possibilities of air survey in the Commonwealth.

This report is a very cheering document. Civil flying is obviously a thing with which Australia cannot dispense. It has been through a difficult time, and has weathered it. The hopes for its future, especially when the air link with Great Britain has been established, are bright indeed.

THOSE ATLANTIC SEADROMES

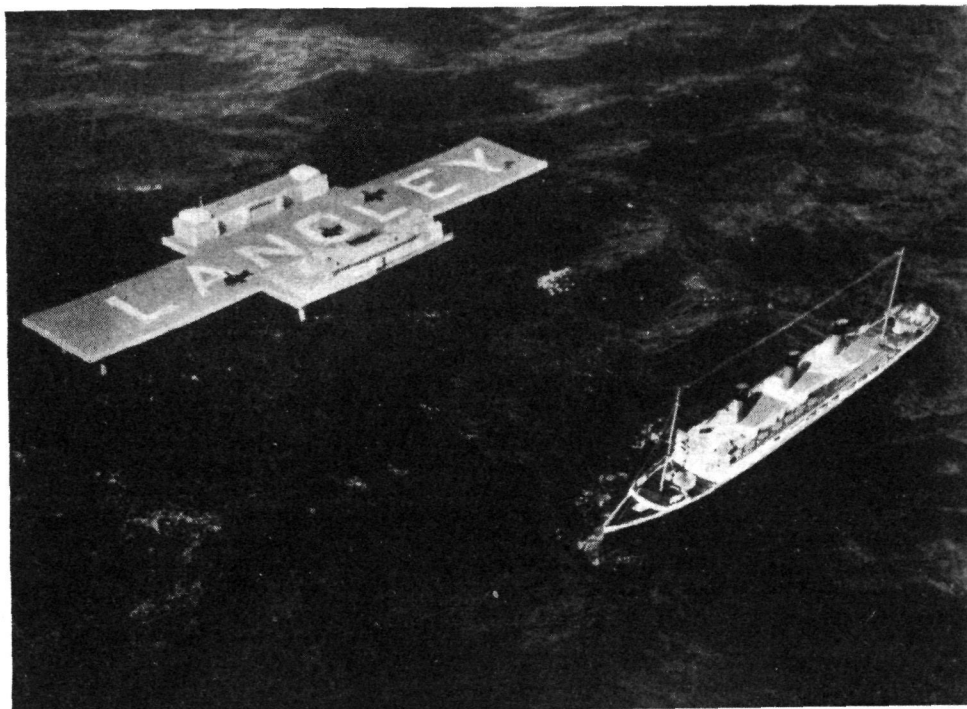
SOME further information is to hand, from the Washington Department of Commerce, regarding the Armstrong Seadrome Atlantic Airway scheme, to which we referred the other week. The announcement reads as follows:—A study with definite experimentations for an airway across the Atlantic Ocean on the 39th parallel of latitude, composed of floating islands at not less than 500-mile intervals, to be financed and owned by the United States Government and established and operated by the Aeronautics Branch of the Department of Commerce, was announced on November 15 by Secretary of Commerce Roper. The Department has received word that the Public Works Administration has allocated funds to initiate work on the project, subject to the approval of the State Department and the President.

Before constructional work on the airway is started, a one-fourth section of one floating platform will be built at a cost of about \$1,500,000 and thoroughly service-tested before the commitment is made for a full unit estimated to cost about \$6,000,000. It is estimated that about four months will be required to build the demonstration section. The entire airway, after its feasibility has been determined, will cost \$30,000,000, and about 80 per cent. of the total will be for labour. This would give employment to 10,000 men for two years.

Studies conducted by the Department's aeronautical experts show that an airway of these floating islands will assure efficient, safe, dependable and profitable 24-hr. mail, passenger and express aeroplane service between the principal cities of the Atlantic seaboard and Western European capitals, Secretary Roper said. The landing facilities of the Atlantic airway will be made available to any commercial aviation company or individual of any country on equal toll schedules, and these toll charges it is estimated will more than pay the operating expenses of the floating islands.

Being assured that any privately-operated proposal of this type would require federal funds, Secretary Roper said, he asked Eugene L. Vidal, Director of Aeronautics of the Department of Commerce, to examine the project and determine whether it would be feasible for the Government itself to establish and operate the floating islands.

After a thorough study, Mr. Vidal concluded that Federal operation of an ocean airway would be consistent



THE ARMSTRONG SEADROME: This photograph of a model of the floating Seadrome illustrates the scheme for an airway across the Atlantic, with seadromes spaced at 500-mile intervals, referred to in the accompanying article.

with the Government's long-standing policy of providing aids to both air and marine navigation. He recommended that public works funds be provided to build an experimental base, and that the project be carried out by the Aeronautics Branch of the Department, in much the same manner as it now provides national emergency landing fields throughout the United States. This recommendation was accepted, and if the Atlantic airway is established, it will be as an extension of the Federal Airways System, which already comprises a nation-wide network of lighted and radio-equipped airways established and operated by the Aeronautics Branch.

"The first island, 500 miles off the Atlantic coast, could be located in such a position as to enable air service to start from several cities on the Atlantic coast, such as Boston, Providence, New Haven, New York, Newark, Philadelphia, Baltimore, Washington, Richmond, Norfolk, Wilmington, N.C., Charleston, S.C., and Savannah," Mr. Vidal said. "Likewise, at the other end of the route, courses could branch off in fan-shaped fashion for London, Paris, Lisbon, Madrid, Rome and points in Northern Africa."

The development of the airway will follow the Armstrong seadrome plan by establishing floating islands or

"seadromes" at intervals along the so-called southern route, via the Azores, Mr. Vidal explained. This type of seadrome is 1,250 ft. long, remains motionless in heavy seas, is anchored and can be equipped with aids to air navigation, accommodation for stopovers and facilities for emergencies. The landing platform is 100 ft. above sea level, and the buoyancy tank counter weights are 200 ft. below the surface and in still water. The cost of each seadrome is estimated at \$6,000,000. However, it has not been definitely determined whether the number, size and spacing of the seadromes, as now considered, will be carried

THE SIKORSKY S.42 AS A TRANSATLANTIC MAIL-PLANE

IN our issue of January 19 last, we published a drawing and brief details of the Sikorsky S.42 flying-boat under construction for Pan-American Airways. It was recently announced by Igor Sikorsky that the first of three machines of this type will be ready for tests in January. The specification to which the machine was designed was submitted to Sikorsky and other American aircraft manufacturers more than a year ago. This specification was drawn up by the Technical Committee of Pan-American Airways, who co-operated with the Sikorsky designers in the development of the design. It called for a range, with full mail load, sufficient to span the longest sections of either transatlantic, or transpacific routes—a range of 2,500 miles against headwinds of 30 m.p.h. The requirements of the specification for both range and load have been exceeded in the Sikorsky design. Construction was actually started more than a year ago—several months before contracts had been awarded. The big Martin boat, which was designed to the same specification, is not expected to be ready until late next summer. This gives Sikorsky a good start, and will enable him thoroughly to test his machine, and incorporate any improvements suggested by the tests in the sister ships which will follow the first model. The S.42 has had to be designed with a view to using her for dual purposes. As Pan-American Airways must, unlike some competitive European lines, cover the entire financial requirements involved in development work, the machine has been designed for use as either a transatlantic mail machine or a passenger aircraft for use on the existing routes between North and South America. Actually her first service tests will be made as a 32-passenger machine on the trans-Caribbean routes of Pan-American Airways. In this form a crew of five and 1,000 lb. of mail and cargo will be carried over a range of 1,200 miles. The New York-Bermuda section of the southern transatlantic route offers the operators a popular passenger traffic, but the actual Atlantic service will be, at first, for mails alone. Mr. Sikorsky wishes to make it clear that, despite the provision of suitable equipment and the operating experience of Pan-American Airways, it is erroneous to think that a transatlantic transport service will be started immediately the S.42 has completed her tests. "The real significance of the completion of this aeroplane is that by simply substituting the original fuel tanks for passenger fittings, which are to be used during the service test runs, America will have a ship which can be called upon to perform a transatlantic air mail schedule if it is possible to inaugurate such a service before Pan-American's full complement of ocean-flying equipment will be available under the present plans." Col. Lindbergh is, of course, at present surveying possible transoceanic routes for Pan-American Airways.

THE SHORT "SCYLLA": Sir Eric Geddes, in his speech at the Annual General Meeting of Imperial Airways, referred to the new air liners now under construction. The accompanying sketch, from *Imperial Airways Gazette*, gives a general idea of the appearance of this new machine, which will be equipped with four engines of the total horse-power of 2,220, and will accommodate 39 passengers and a crew of four.

out if the entire airway is to be built. The rapid development of the aeroplane may eventually change the final plans for the technical layout of the seadromes.

Mr. Vidal said that in his opinion safe and reliable transatlantic scheduled service can be operated in the near future by airships, by large flying-boats and by aeroplanes using the seadrome airway. The economic advantage in the seadrome airway is its facilities for refuelling *en route*, since the fuel load of present and near-future flying equipment greatly reduces the pay load, namely, mail, passengers and express.

NEW MACHINES FOR EUROPEAN AIR LINES

MR. BALZ ZIMMERMANN, manager of the Swissair Company, recently left for America to buy some new high-speed aircraft for his company. Twin-engined machines of two different types are under consideration. M. Henri Cornélius, a director of Sabena, is now in Rome. It is rumoured that new equipment for Sabena will be of French and Italian construction. M. Esders, a generous patron of French private flying, has sailed for New York to purchase a Northrop "Delta" for his personal use.

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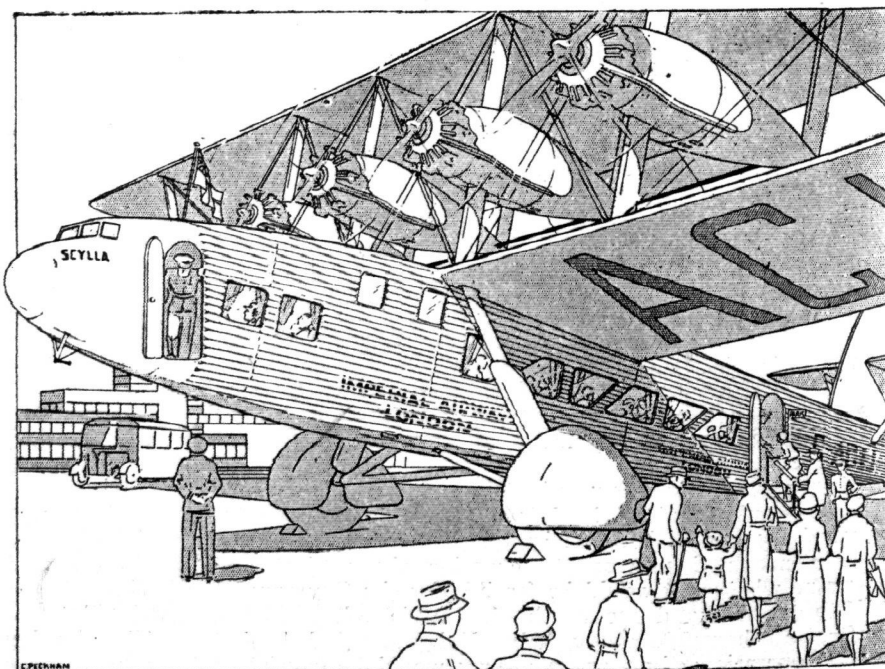
THE Postmaster-General announces that the air postage rates for Iraq, Syria and Transjordan have been reduced, and are now as follows:—Letters: First half ounce, 3½d.; each additional half ounce, 2½d. Postcards, 2d. These rates are the same as those to Egypt and Palestine.

AIR MAIL FOR SIAM AND FAR EAST

ON and after December 9, air mail correspondence for Siam, the Straits Settlements and Malay States will be forwarded by the England-India-Straits Settlements air mail service, and the latest time of posting in the air mail letter-box outside the G.P.O., London, for these destinations, will be 10.45 a.m. on Saturday instead of 11 a.m. on Wednesday as at present. At the same time, the air postage rates for Siam, the Straits Settlements and Malay States will be reduced to 11d. per half ounce for letters and 5d. for postcards. Correspondence for the countries mentioned sent by the service leaving London on Saturday, December 9, should be delivered before Christmas.

MISR-AIRWORK IN EGYPT

THE regular Cairo-Alexandria service operated by Misr-Airwork has been busy as usual, and many passengers of note have been carried. A survey trip to Assiut, Luxor and Assouan was undertaken by the management, and arrangements have been satisfactorily completed for a bi-weekly service to these three cities to commence provisionally on December 15. A number of priests chartered a "Dragon" for a visit of a few hours to the monastery at Wadi Netrun. The Hon. F. Guest and Mr. Vanderbilt were among the passengers on a special Alexandria-Cairo charter arranged by Misr-Airwork on behalf of Imperial Airways to connect with one of their regular southbound services. H.E. Sir Percy Loraine and party were transported by Misr-Airwork to a shooting party near Ekyard.





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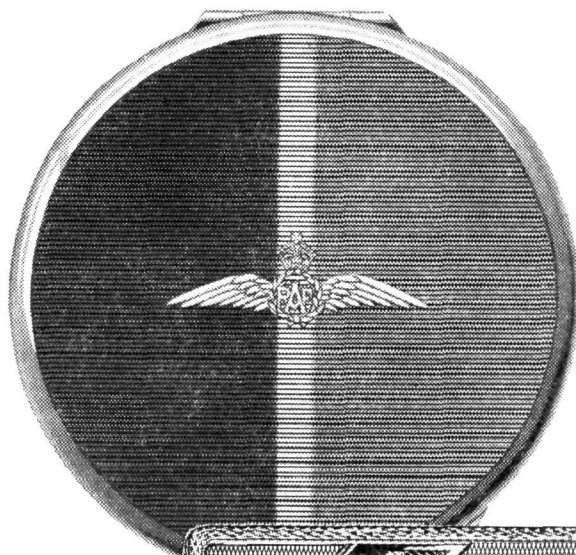
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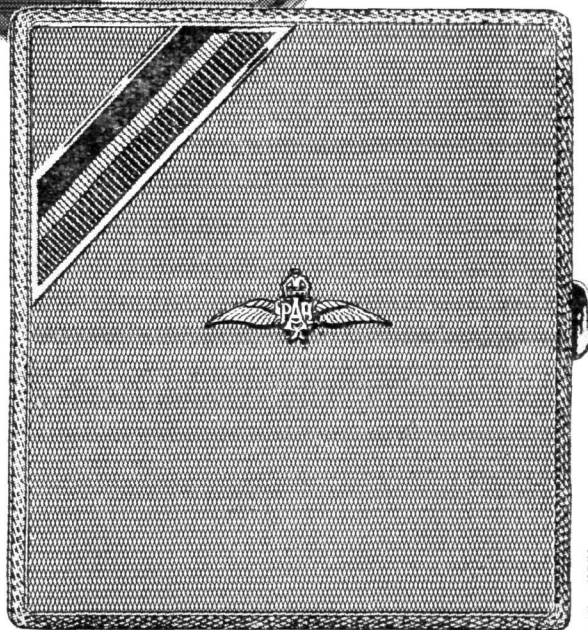


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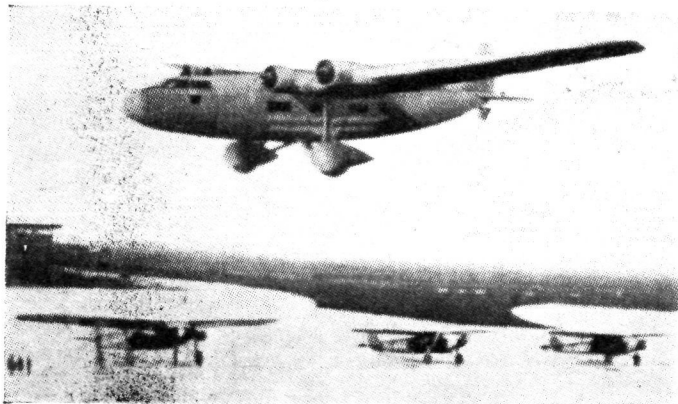
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The Fokker F.22, four "Wasp" TIDI engines.

THE NEW FOKKERS

WE have now received a few details regarding the Fokker "F.22," the first of two new types of large four-engined passenger machines under construction at Amsterdam. Four Pratt & Whitney "Wasp" TIDI engines will be fitted, driving adjustable-pitch metal airscrews. The main features are as follows:—Top speed, 162 m.p.h.; cruising speed, 137 m.p.h.; weight, empty, 16,720 lb.; useful load, 11,330 lb., and total weight, in flying order, 28,050 lb. Accommodation for 20 passengers and a crew of four is provided. The equipment includes a kitchen. Three "F.22's" have been ordered by K.L.M., and the Swedish A.B.A. ("Scandinavian Air Express") intends to operate another. The machines will be used on the Malmoe-Copenhagen-Amsterdam service. The second of the two new types will have four Wright "Cyclone" engines, and will seat about 35 passengers. No data are at present available.

THE GERMAN AFRICA-AMERICA SERVICE

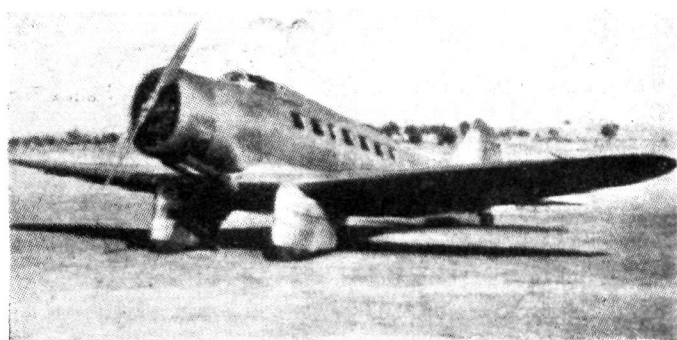
THE second series of experiments made with the s.s. *Westfalen* in the South Atlantic have proved successful. It is understood, however, that it is desirable that a second catapult ship be provided. It will be remembered that at the beginning of the experiments with the *Westfalen*, it was proposed to launch the flying-boats by catapult at the African terminus. The installation of heavy oil engines in future types of flying-boats is being considered in Germany, in order that the Africa-South America connection may be flown non-stop.



MARTLESHAM DINES THE INDUSTRY

PRESIDING at the Annual Dinner, on December 1, given by the Commanding Officer and the Officers of the Aeroplane and Armament Experimental Establishment at Martlesham Heath, to the members of the aircraft trade, GRP. CAPT. A. C. MAUND said that he was back again at Martlesham after an interval of twelve years, and among the many innovations he found none were so sound as this annual dinner. He offered a very hearty welcome to the guests and then proceeded on a short dissertation about disarmament. He felt that unless other countries disarmed, we should have to re-arm to a position of equality, and if this came about, then he thought that quality in equipment would perhaps replace quantity, and that quality was, he felt, admirably maintained in our own aircraft industry by the co-operation which existed between the testing establishment which he commanded and the aircraft constructors themselves.

MR. C. R. FAIREY, in reply, thanked all those at Martlesham Heath on behalf of the industry for the past year of service. He thought that Martlesham was absolutely unique and that its value to the trade was very high, because it was the one place in the world where it was possible to have an aircraft tested and to get entirely unbiased criticism, yet, notwithstanding that fact, they still offered a most delightful welcome to the makers of the machines they criticised. Mr. Fairey also suggested that variable pitch airscrews, detractable undercarriages and some of the more modern forms of super-efficient wings ought to be developed, particularly with reference to the forthcoming race to Australia. [How about an entry from Mr. Fairey? He has considerable experience with fast machines.—ED.] He thought that the industry had never



The Northrop "Delta," as supplied to A.B.A.

AMERICAN EQUIPMENT FOR A.B.A.

A "DELTA" type monoplane has been ordered from the Northrop Corporation, of Inglewood, California, by the A.B. Aerotransport Co. of Stockholm. The machine will be used on the Malmoe-Copenhagen-Amsterdam service in company with the new Fokker F.22. If the service tests are successful, more "Deltas" will be ordered for the re-equipment of the night mail service between Stockholm, Malmoe, Copenhagen and Hannover at the beginning of next summer. Mails leaving Stockholm at 19.30 in the evening will arrive at London and Paris at 05.30 next morning, in time for the first delivery. The "Delta," when fitted with the Pratt & Whitney "Hornet" TIDI 700-h.p. engine, has the following performance:—Top speed, sea level, 200 m.p.h.; cruising speed, 175 m.p.h.; weight, empty, 4,092 lb.; disposable load, 2,904 lb., and total flying weight, 6,996 lb. [We now learn that two A.B.A. representatives are at the Northrop works to take delivery of two more "Deltas" for night mail services.—ED.]

IMPERIAL AIRWAYS' NEW PARIS TERMINUS

IMPERIAL AIRWAYS' arrival and departure station in Paris is now at: Airway Terminus, Rue des Italiens, Paris. Telephones: Taitbout 60-50, 60-51, 60-52, 60-53 (day and night). Telegrams: Flying, Paris. In addition to being centrally and conveniently situated, this new station is equipped to handle a very much larger volume of traffic than has hitherto been possible. Its use will add greatly to the comfort of the passengers to and from London and Switzerland. The present arrival and departure station in the Hotel Bohy-Lafayette will no longer be used.

been more up against it than it was now and that Martlesham did a very great deal in assisting them to retain their supremacy in the world. As usual, Mr. Fairey concluded his remarks with several humorous stories.

MR. HANDLEY PAGE, who seconded Mr. Fairey, said that it was a great relief after protracted battles with the Air Ministry, to come to Martlesham, where one's worth was really recognised. He then proceeded to cause much laughter by one of his inimitable word pictures, wherein he placed the Padre in his position and himself in that of the Padre. He suggested that it would no doubt require a Fairey "Prince" to effect the transformation. [A very apposite suggestion, as we imagine that it would require considerable "power" to transform Mr. Handley Page into anything else than himself.—ED.] Mr. Handley Page, as is his wont, interspersed his talk with many biblical quotations, all of which were much to the point. He humorously referred to Messrs. England and Cordes (Handley Page test pilots) as suitable to be his church wardens in his new position. He also went on, still in the same humorous vein, but in a manner which overlaid a great deal of sound criticism, to suggest simplification and improvements to the two Air Ministry documents which cause manufacturers so many sleepless nights, namely, A.P. 1208 and 970.

MR. C. G. GREY, who was also asked to speak, said that he felt Mr. Leslie Irvin a far more fitting man to talk at a gathering of that nature, as, whatever sins the aircraft constructors committed, Mr. Irvin was sure to get them out of it safely. He also referred to the fame achieved by Mr. Handley Page by getting a paragraph in *Punch* all to himself.

From the Clubs

THE HAMPSHIRE AEROPLANE CLUB'S ANNUAL DINNER

THE eighth Annual Dinner and Dance of the Hampshire Aeroplane Club was held in the South Western Hotel on Friday, December 1, and, as usual, was a very cheery and most enjoyable affair. After dinner was over and the health of His Majesty had been proposed by the Chairman, the Rev. E. Bruce Cornford, and duly honoured, the assembled company settled down to listen to speeches. The Mayor of Southampton, Councillor W. D. Buck, set the ball rolling by proposing the toast of "The Club." He expressed the pleasure and privilege he felt at having the honour to propose this toast. It appeared to him that several members of the Club were trying to establish a record by seeing how close they could fly to the chimney-pots of Southampton without fouling them; however, no complaints had been received. Complaints had, however, been received about Sunday flying, but he himself felt that, if flying was prohibited on Sunday, the progress of civil aviation would be seriously curtailed. The Club was founded in the year 1926, the Mayor continued, and they were all very pleased that the founder, Mr. O. E. Simmonds, M.P., was present that evening. The Club had an excellent record, there being 700 members, of which 200 had learned to fly and qualified for "A" licences. If a Territorial Air Force was ever formed at Southampton, the Club would be an excellent foundation. Turning to the subject of the aerodrome, its future was at present in the hands of an aerodrome sub-committee, but he would give his assurance that the municipality were doing everything possible, within reason, to further the growth of aviation in Southampton.

Mr. G. H. Winn, in replying to the toast, thanked Lady Bailey for coming down once again. He then confined himself to figures. During the present year 1,826 hours were flown, an increase on the previous year; one machine alone did 620 hours. Only one machine had been seriously damaged during the year. The number of new members for the year was, up to the present, 69, of which number 63 are pilot members. The number of "A" licences gained totalled 30, a 50 per cent. increase on last year. The Club looked forward to the day when they would have a well-equipped club-house. The municipalities of Bristol, Norwich, Manchester, Hull and Portsmouth had built club-houses, and he felt that it was unlike Southampton to be outdone by Plymouth.

The next speaker was Mr. F. D. Bradbrooke, who was called upon to propose the toast of "Civil Aviation." There were people, he said, who lived near aerodromes who could not think why flying was ever invented, and there were other people, like postal authorities, who could not think. The advance of civil aviation, however, was not going to be stopped by such people. Newspapers preached the danger of the roads, and it looked as if aviation might become a very suitable substitute for excessive motoring. Aviation at present seemed to have reached a point when facilities were waiting for further developments, and further developments were awaiting facilities, so progress was bound to be slow. The speaker then drew attention to Imperial Airways, which company was of unbounded value to the Empire, although, so he thought, handicapped by great lack of sympathy and backing from home. (Incidentally, we are sorry to hear that Mr. Bradbrooke does not consider "civil" aviation compatible with "civilised" aviation. There are politicians who would agree with him.)

Lt. Col. F. C. Shelmerdine, C.I.E., O.B.E. (Director of Civilian Aviation), in replying to the toast, said that he was very glad to hear Mr. Bradbrooke pay a tribute to Imperial Airways, "because it is rather the fashion in this country to decry our civil aviation and to compare it unfavourably with the United States and France and other countries where money is literally poured out. I think that with the sums which we can spend on commercial aviation we are probably getting a better return for the money which we spend than any other country in the world." Lt. Col. Shelmerdine then dwelt upon the progress made by Imperial Airways during the past year, the extensions to Karachi, Rangoon and Singapore. By the end of next year, when the extension to Australia had been completed, he hoped that Great Britain would have the longest air line in the world. Later on still it was hoped to extend to New Zealand and to connect up Rangoon with Hong Kong and Shanghai. We were spending less than any other great country, he continued, and he felt sure that we had got to sit up and spend more. The greatest difficulty was the upkeep of aerodromes abroad, and the heavy rain experienced in some countries made runways a necessity. Higher speeds had got to be aimed at. The past year had been remarkable for developments, but further aerodromes throughout the country must be laid down.

Mr. O. E. Simmonds, M.P., in proposing the toast of



THE "HAWK SPECIAL": This is the latest machine turned out for Phillips & Powis, Ltd., of Reading, by Mr. G. H. Miles, and is called the "Hawk Special." Powered with a "Gipsy III" engine, the top speed is in the neighbourhood of 130 m.p.h. Both the climb and take off are exceptionally good, and the machine has a remarkably good outlook forward for the pilot, while the passenger can see the surrounding country unimpeded, by virtue of the low side-windows. This particular machine is being flown to Cairo by Mr. Stephen Cliff, and when out there he will compete in the competitions arranged during the Oases Meeting. (FLIGHT Photos.)

"The Guests," proceeded to divide the ladies present into two classifications. "Those who of their own initiative have given lustre to their names, and they were happy to have one with them who is at the very top of that class among English women—Lady Bailey. Then we have the ladies with us who have the very honourable distinction of being known to us chiefly as the wives of their husbands. They alone know to what measure the roots of their husband's wisdom lie in family soil." After which little tribute Mr. Simmonds proceeded to mention other guests, gentlemen in the paraphernalia of their corporation dignity, Group Capt. F. E. T. Hewlett, a member of a distinguished service which had but lately received from the Secretary of State for Air the "Magna Charta" of British air supremacy; Lt. Col. Shelmerdine, who was in the hopeless position of a Director of Civil Aviation, who had to look up to a military air council, like unto a civil servant responsible for ordinary private motoring having to look up to an Army Council; and Sir Alliott Verdon-Roe, in whose connection Mr. Simmonds perpetrated some puns concerning flying through the stratosphere and getting butter in the carburettor while passing down the milky way, finishing with an allusion to an air service from London to Cowes. Mr. Westbrook was to be congratulated on his appointment as General Manager to the Supermarine Aviation Works, and that company on the Air Ministry order of ten "Scapa" flying boats; and lastly the Church was ably represented by the Chairman.

Mr. W. Craven-Ellis, M.P., replying to the toast, said he had good faith in Southampton as an airport. He praised the Corporation in taking an interest in the airport, and stressed the value of getting young men interested.

Councillor Hector Young then proposed the toast of "The Chairman," to which the Rev. E. Bruce Cornford, M.A., replied briefly. He had looked up some nursery stories to tell, but after hearing the tapping of impatient feet under the table decided not to tell them. He was very grateful to those who had made speeches during the evening. Adopting the rôle of the Church militant, the Chairman finished up with an appeal for a stronger Air Force, pointing out that we had dropped down from first to fifth place. "For our security, the security of our homes, our wives, our children, it must be done, and in the immediate future, for no one knows what is going to happen in the next eighteen months."

After dinner a film was shown which had been produced by members of the Club. It is with the greatest regret that we have to admit that lack of space makes a description worthy of it impossible. It really was a remarkable effort for actors of amateur status, and the producer, Mr. I. Lansdowne-Wynde, is to be heartily congratulated, as also is the photographer, Mr. E. T. Moxham. The sound effects are worthy of a mention, though we should like to know the make of that machine gun.

BRISTOL AND WESSEX AEROPLANE CLUB

New flying members during the week were Messrs. C. J. Packer, H. F. Bromwich and T. G. N. Pearce. First soloists were Messrs. F. Ashton White and T. G. N. Pearce. A Christmas Party is being held in the clubhouse on Saturday, December 16. The Club will be closed down for the Christmas holidays from Saturday, December 23, to Tuesday, December 26, inclusive; the airport, however, will remain open.

READING AERO CLUB

Mr. E. D. A. Bigg, who set out to fly back to Nairobi in his own Miles "Hawk," has arrived at his destination, and reports that he had no trouble from either machine or engine, and the machine has aroused much interest and favourable comment in Africa. Mrs. Elise Battye has been appointed personal pilot to Commandant Mary L. Allen, of the Women's Auxiliary Reserve Service (Police Force). Mr. Stephen Cliff's "Hawk" has been flying and he hopes to start for Egypt very shortly. The machine is finished in red and silver. Mr. Ruddle has received his "A" licence and is shortly starting on a tour of the Continent with a private owner. The next Club dance, which will be a special Christmas function, takes place on Saturday, December 16.

LIVERPOOL AND DISTRICT AERO CLUB

Flying returns for the week ending Friday, December 1, amounted to 8 hr. 40 min. dual, 9 hr. 55 min. solo and 1 hr. 55 min. night flying, a total of 20 hr. 30 min. Throughout the whole month of November flying has been curtailed by thick mists. Night flying started on Wednes-

day, November 29, when conditions were good but exceptionally cold.

SOUTHERN AERO CLUB

New members who have enrolled this month include Miss S. M. Dunsford, who is renewing her "A" licence, and Mr. R. B. Waters, who is renewing his "B" licence; Mr. Wilshaw, who learnt to fly at Shoreham in 1927, has returned after a long absence abroad. The Club's "Avian" has flown 24 hr. during the month. Mr. A. Auping, who took his licence last year, has bought a "Fox Moth" and is on his way to India to join Capt. Barnard's circus. A number of cross-country flights have been done. The clubhouse was polished and decorated for the first dance of the season on November 18; about 50 guests and friends attended.

THE LONDON AEROPLANE CLUB

Flying times for the month totalled 192 hr. 20 min. and for the past week 40 hr. 45 min. Mr. Singh made his first solo flight and Mr. H. S. Ellis completed his "A" licence tests. The Club will be closed for the Christmas holidays from Friday, December 22, to Thursday, December 28. The restaurant will be closed on December 24, 25, 26 and 27.

HANWORTH (N.F.S.)

Three new members joined the Club during the week and one of them, Mr. Tweddle, gained his "A" licence within a few days of joining. On Friday, December 1, Mr. Llewellyn flew a representative of Fox Photos above the clouds to take photos. The Insurance Flying Club has carried out a good deal of flying over the week-end. The Vacuum Oil Co.'s D.H. "Dragon" has returned to Hanworth after a prolonged flight to Java.

YORKSHIRE AEROPLANE CLUB (N.F.S.)

Flying times for the week totalled 11 hours. There was only one visitor during the week, a Percival "Gull" belonging to the Hon. L. Guinness.

CARDIFF AEROPLANE CLUB

Very little flying was done during the week owing to rough weather, only 35 min. dual, 2 hr. 40 min. solo and 20 min. tests being done. One "A" licence was obtained by Mrs. S. K. Davies.

HERTS AND ESSEX AEROPLANE CLUB

During the past week nearly 30 hours were flown, the month's total being 150 hours, of which 100 hours were solo. Mr. Gates did his "A" licence tests and Mr. Moss further tests for his "B" licence. On November 8 and 11 the Club's "Cirrus Moth," piloted by Mr. Thomas, took part in the bombing of a submarine at Weymouth for the new Gaumont British film "Jack Ahoy."

LANCASHIRE AERO CLUB

The annual ball of the Lancashire Aero Club was held in the Midland Hotel, Manchester, on Friday, December 1. Sir John and Lady Siddeley held a reception in the Alexandra Suite and welcomed members and friends of the Club. After the reception, dancing was carried on to the Casani Club Band, directed by Charlie Kunz, who during supper captivated the gathering by delightful piano solos. Later on, Mr. Santos Casani, partnered by Mrs. Gardner, entertained everyone with exhibition dances. The decorations were arranged by a ladies' committee and included many gaily-draped propellers kindly lent by the Club's good friends, Messrs. A. V. Roe. The health of the Host and Hostess was proposed by the Chairman of the Club, Mr. Peter Eckersley.

KENT FLYING CLUB

The flying time for the week totalled 16 hours, there being one first soloist, Mr. Bacon, who only had 5 hr. 30 min. dual. New members include Miss Payne, Messrs. Anderson, Bacon, Prangnell, Wren, Roper-Pitman, Lott, Fitt, Stanbridge and Stewart. The Club dance is being held at the Odeon Hall, Canterbury, on Friday, December 8. Tickets, 4s. single and 7s. double, may be obtained from the Club or at the door.

THE AIRCRAFT CLUB, HARROGATE

There has been no soaring weather at Sutton Bank for the last seven weeks. The "Zephyr" has been brought back to Harrogate to save it getting snowed up. The new arrangement is to meet at the White House, Starbeck, at 10 a.m. on Sundays, and proceed with "Zephyrs" to the most suitable soaring site. If the weather is unsuitable, work will be done on the new training machine. Every Tuesday and Friday night work will also be done on the new machine in the clubroom.

Airisms from the Four Winds

The Lindberghs fly on

As reported last week, the Lindberghs reached Villa Cisneros, Rio de Oro, on November 26. Two days later they flew to Porte Praia on the Island of Santiago, in the Cape Verde group, a distance of 700 miles. On Thursday, November 30, they flew 300 miles to Bathurst, Gambia.

The French West African Flight

TWENTY-FIVE of the original 30 Potez 25's (Lorraine) which are touring French West Africa in formation, have reached Archambault, thus completing about half of the journey. During the past week the squadron visited Niamey and Gao. After reaching Gao on the Niger, the squadron flew westwards and touched the coast at Dakar, after which it retraced its steps.

The Barnard Circus off to India

FLYING in his Fokker monoplane *Spider* ("Jupiter"), Capt. C. D. Barnard left Heston on Saturday for India. Capt. Barnard has planned a six months' tour with his "circus" of eight aircraft, on which he will visit between 60 and 70 different centres. This means that over a million people will see formation and stunt flying who have never seen such a thing before, and the visit should do much to create air-mindedness in India. Accompanying Capt. Barnard in the "Spider" are his wife, Mr. J. Mackay, the second pilot, a parachutist, a mechanic and an announcer. The trip to India should take about ten days.

"—and now the Ulms"

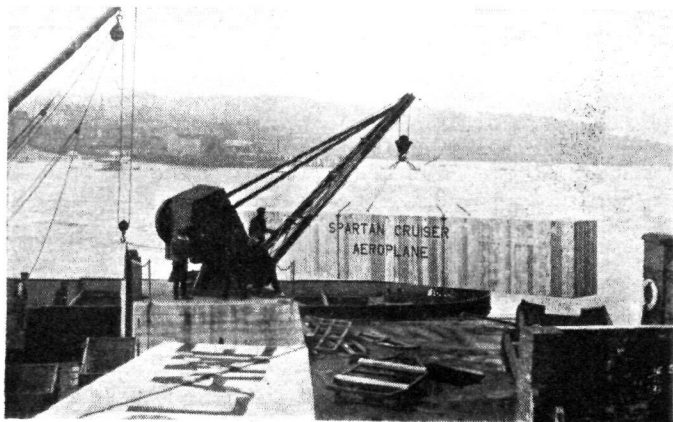
MATRIMONY, it seems, induces long-distance flying. The Mollisons and the Lindberghs flit happily about the globe, now Mr. Charles Ulm has taken his wife with him on a 1,400-mile flight across the Tasman Sea. Mr. "Jock" Allen and his secretary, Miss Rogers, accompanied the Ulms. Mrs. Ulm and Miss Rogers are the first women to make the Tasman crossing by air.

Starting young

VITTORIO MUSSOLINI, the 13-year-old son of the Duce, intends to qualify for his pilot's certificate, and has already taken his first flying lesson. He is both keen and apt. In this he resembles his father, who, in 1920, before the march on Rome, took a course of flying instruction, and proved himself to possess all the attributes of an excellent pilot.

More honours for Everest flyers

COL. P. T. ETHERTON, Mr. Stewart Blacker, Flt. Lt. D. F. McIntyre and F/O. R. C. W. Ellison, some of the members of the Houston-Mount Everest Flight, will be the



EN ROUTE FOR INDIA: A Spartan "Cruiser" being shipped from Southampton for the Maharajah of Patiala.

guests of the Société de Géographie at a dinner in Paris to-day, Thursday, and a reception on Friday, at which the President of the French Republic will be present. On Friday evening Mr. Blacker will give a lecture which he will illustrate by a part of the film of the expedition and some lantern slides. The party will fly by Air-France to Le Bourget on Thursday.

"Red" propaganda from the blue

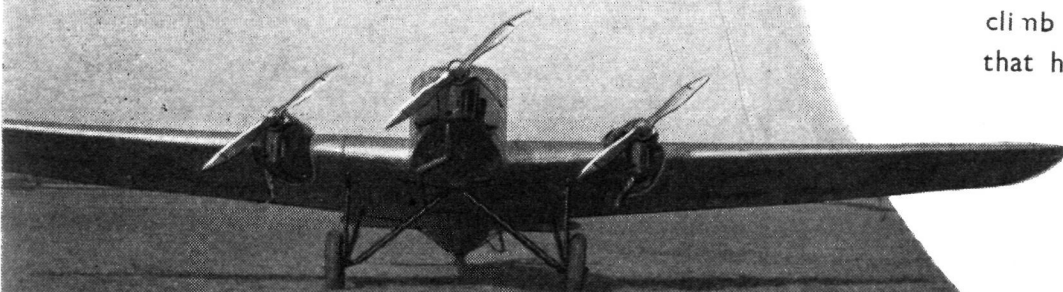
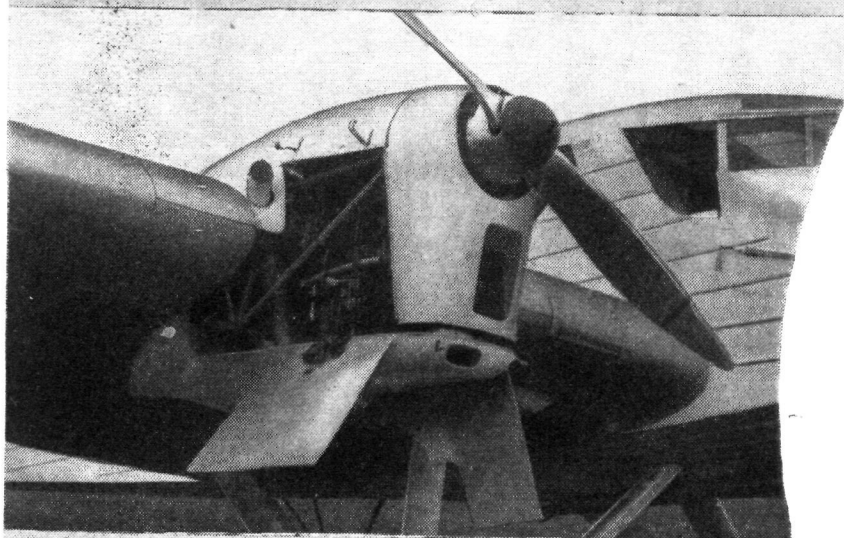
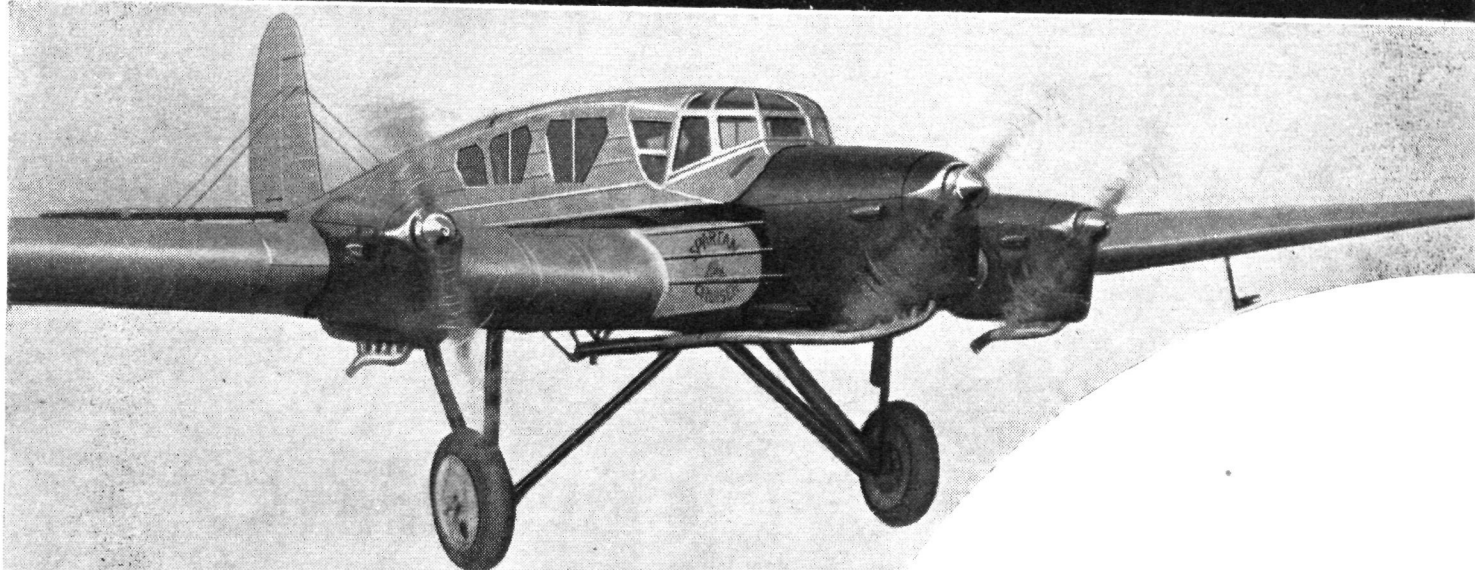
AN aeroplane flew over Le Creusot on September 29 and scattered about 40,000 Communist leaflets over the town, which is the site of the great armament factories. The occupants of the machine were M. Salel and a Communist called Rousseau. On being charged at Autun on December 1, Salel declared that he had been hired to distribute commercial circulars. He escaped with a caution and a 50-franc fine for low flying. His passenger was fined 300 francs for a breach of the Press Law.

Mr. Handley Page wins his appeal

ON November 30 Mr. Frederick Handley Page was allowed an appeal against a decision by Mr. Justice Finlay in the King's Bench Division affirming an income-tax assessment on £30,483. The money was an award by the Royal Commission on awards to inventors in respect of "O" and "V" type bombing aircraft built during the war. The Master of the Rolls, in his judgment, considered it an *ex gratia* payment, which was not subject to tax.



ITALY'S AIR MINISTRY: Rome's Air Ministry, shown here, has recently been built in a new part of the City, and is considered the finest Air Ministry building in the world. Much is due to Marshal Balbo, who besides leading the two spectacular mass flights across the Atlantic, designed the interior of the Ministry. There are several outstanding features that would immediately strike any visitor. The desks of all officials have no drawers, only shelves, thus ensuring no work being put out of sight, and perhaps forgotten. Each room is connected by pneumatic posts, thus as each document arrives, in a few seconds it is being handled in the department concerned. Every person in this building lunches (all standing) in one huge room, no distinction being made for the chiefs. Also to save time coffee can be served in special containers by the pneumatic tubes.



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Coachbuilt Saloon. ... Black with Coachbuilt Saloon. ... £450
1934 DAIMLER 16 h.p. Coachbuilt Saloon. ... brown leathery upholstery front and rear ...

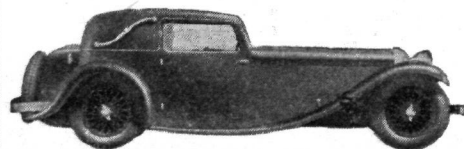
Here is a selection from our used Car stock:—
1932 BENTLEY 4-litre Special Mulliner Sedan de Ville. Finished black. Carefully kept. One owner. Small mileage £695
1933 ALVIS Firefly 12 h.p. Pre-selector gear-box model. Very little used. ... £395
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Rejoining their Regiment by air

MR. PAT RANDOLPH, whose departure from Heston was reported in our Heston Notes in FLIGHT for November 16, has arrived at Almaza in his "Gull," with Capt. Goschen (both of the Grenadier Guards), and has joined the flying school as the first step in a two-years' stay in Egypt.

A Comper "Swift" in Egypt

THE first Comper "Swift" to be imported into Egypt was assembled by Misr-Airwork at Dekheila, Alexandria, and flown to Almaza. An American-built "Moth," purchased by M. Jean Attard, is also in course of erection at Dekheila.

Lighter French engines

TESTS are about to be made with the Gnome-Rhone K7, K9 and K14 series of engines, all of which have been lightened about 88-110 lb. This economy in weight was effected by the use of magnesium alloy castings and the fitting of shorter crankshafts.

French Grand Prix, Deauville-Cannes-Deauville

THE French Aero Club has issued the regulations for the International Speed Contest for the Cup presented by M. Armand Esders and prizes amounting to 200,000 francs. The Contest will be held over the course Deauville-Cannes and return on July 21-22, 1934, and is open to aircraft with engines of a total cylinder displacement not exceeding 8 litres. Regulations may be obtained from the Royal Aero Club, 119, Piccadilly, London, W.1.

Sir Philip Sassoon 21 years an M.P.

SIR PHILIP SASSOON has now represented the Borough of Hythe for 21 years, and in commemoration of his first election, he was presented on November 30 with an illuminated album containing the names of 2,500 donors to the book, which was purchased out of donations of not more than 1s., and with a cheque, which Sir Philip said would be given to the Folkestone Hospital. He hoped that it might go towards the foundation of a cot.

Antoni Wing machine crashes

THE Breda monoplane on which has been fitted the Ugo Antoni variable-camber wing crashed on Chosen Hill, Churchdown, near Gloucester, on Friday last. Mr. H. J. Saint, Gloster's chief test pilot, had taken the machine up in very bumpy weather, and a couple of minutes afterwards wing flutter developed, portion of the port aileron came adrift and the machine sideslipped into some trees, Mr. Saint escaping with minor injuries. At present the exact cause of the mishap is not known. The machine had been flown for many hours previously by Capt. Rex Stocken, and no tendency to wing flutter had been discovered. Mr. Saint's explanation is that the bumpy weather caused the flutter, and that the stabilisers near the fuselage must have prevented him from changing the attitude of the machine so as to stop the flutter.

20 miles up

ANOTHER ascent into the stratosphere is reported to be about to take place, but this time in an open basket of a balloon, and to heights up to the present unthought of. The ascent will be made by Mr. Mark Edward Ridge, a young American, 28 years old, and in place of an airtight compartment suspended from a balloon he will rely on a special apparatus designed for him by Sir Robert Davis, managing director of Siebe, Gorman & Co., to the specification of Prof. J. S. Haldane, which is something in the

nature of a diving suit. Attired in this special suit, Mr. Ridge has already, at the works of Siebe, Gorman & Co., Lambeth, S.E., been subjected to reduced atmospheric pressure representing a height of 90,000 ft., or over 17 miles. This test was carried out in four steps. To start with, an atmospheric pressure representing a height of 43,000 ft. was achieved, at a second test Mr. Ridge was subjected to atmospheric pressure representing 50,000 ft., next the 63,000-ft. mark was reached, and lastly pressure representing 90,000 ft. was attained.

The Sylvan Debating Club

ON Monday, December 11, at 8 p.m., the Sylvan Debating Club will debate the following motion: "That in the opinion of this House the aeroplane is the most civilising influence in the modern world and the most potent influence for peace." The proposer is Mr. Handley Page and the opposer the Vice-President of the Sylvan Debating Club. The Club will be thrown open to non-members (men only), and the Air League hopes that all those interested in aviation will take the opportunity of hearing and taking part in what will undoubtedly be an instructive discussion. The Sylvan Debating Club meets at 4, Southampton Row, W.C.1.

International Aeronautical Conference—Cairo

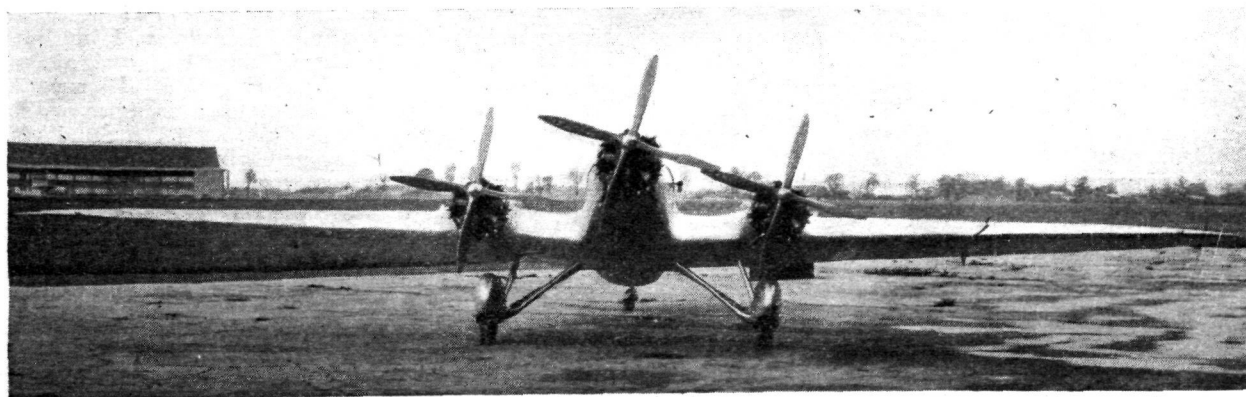
MR. W. LINDSAY EVERARD, Vice-Chairman of the Royal Aero Club, and Maj. C. J. W. Darwin, D.S.O., will attend the Conference of the Fédération Aéronautique Internationale, to be held in Cairo on December 19-23, as representatives of the Royal Aero Club. Seventeen British competitors have entered for the International Oases Air Meeting to be held at Cairo on December 18-24. The Royal Aero Club has been notified by the Egyptian Government that British competitors, taking part in the meeting, will be admitted into Egypt without diplomatic permits.

London to Melbourne air race

THE MacRobertson International Air Race from London to Melbourne, to be held on October 20, 1934, has been inscribed on the F.A.I. International Aeronautical Calendar of Events for 1934.

Palmer landing equipment

THE Palmer Tyre, Ltd., of Aldwych House, London, W.C.2, has, since 1913, thoroughly studied the problems connected with landing equipment for aircraft. It is apparent from the fact that every aircraft which left England during the war was Palmer equipped, that, from the beginning, the company was successful in this field. To-day, there are Palmer wheels, tyres and brake systems applicable to machines of every type. All these are very clearly described and illustrated in a new booklet, "Palmer Aircraft Landing Equipment," produced by the company. Braking systems of both pneumatic and hydraulic types are included, each with numerous optional methods of control. The pneumatic system is particularly well adapted for use in very large machines, where the air may be drawn from the supply used for starting the engines. The "streamlined" types of wheels obviate the construction of "spats," which, on the whole, prove quite expensive, besides adding weight to the aircraft. We would strongly advise those to whom the latest types of braking systems for aircraft are a sealed book—and there must be many—to obtain a copy of this exceptionally well-produced booklet.



AN ANGLO-FRENCH COMBINATION : The Couzinet type 101 monoplane, fitted with three "Pobjoy" engines. This machine is expected to take part in the race meeting at Cairo.

Airport News

CROYDON

THE Scandinavian Air Express is a service well known to travellers, and between London and Amsterdam it is operated exclusively by the Dutch company. From Holland to Copenhagen and Malmö it is, however, partly operated by the Swedish A.B. Aero Transport, and it was a novelty to see one of that company's Fokker F.12 machines at Croydon on Friday last. The A.B.A. F.12 is painted light blue, is fitted with wheel spats and bears the unfamiliar registration SE-ACZ. The object of the visit was to convey H.R.H. the Swedish Crown Princess home to Malmö, which was duly accomplished on Saturday. Inwards to Croydon the *Värmland*, as it is called, carried Mr. "Tim" Hunt, the well-known racing motor cyclist, who broke a thigh bone in the Swedish Grand Prix as long ago as last August. He was still on a stretcher when he arrived at the London Terminal Airport, and was accompanied by his mother and father. "The trip," he said, "had been admirably smooth." The Swedish pilots were Capt. Lindholm and Second Officer Ahblom.

British Air Transport, whose interest in the new Redhill Aerodrome has been noted elsewhere, have been doing quite a lot of night flights over London at fares of £2 2s. per trip. The lights of London, especially those at Piccadilly Circus, are a sight very well worth the money, according to passengers, and the river, seen from the air, is another pleasing spectacle. One of the B.A.T. pilots reported a curious change of temperature during one of these night flights. Although intensely cold on the tarmac, it was considerably warmer a few thousand feet over London.

Imperial Airways, Ltd., are going to duplicate their African services from here as far as Cairo, I understand, both on December 6 and December 13. The first duplication is due to increased passenger bookings and the second is on account of extra heavy Christmas mail.

The Fokker F.20, which was to and from several times during the last week, is to make an extra trip to Batavia and back with Christmas and New Year mails. Messrs. Smirnoff and Soer, who have flown it in and out of Croydon since its delivery to K.L.M., will fly the machine, and it is hoped to cover the 9,000 miles from Amsterdam to Batavia in five days. On one of the F.20 inward trips to Croydon from Rotterdam last week the journey was done in 1 hr. 7 min.

In this bitter weather the Imperial Airways' covered gangway to the machines is proving its worth. It is now

painted silver colour to match the airliners. I hear that work is to begin shortly on the alterations and improvements at this airport, which will allow passengers' passports to be dealt with before Customs examination of their baggage. Though speed in dealing with passengers is more important at Croydon than elsewhere, the Airport of London is about the only port in England where passports are not dealt with first. This means that the passengers hang about doing nothing whilst the machine is being unloaded and the luggage is being brought into the Customs Hall. Under the new system passports will just about be finished with in most cases by the time luggage is ready for examination. The new arrangement should be an ideal one, and from another point of view will have the advantage of releasing a number of offices for rental by air companies, which are situated in the inner or "emigration" hall, and are now occupied by those whose duties are concerned with passport formalities. It seems likely that more office accommodation may be needed here next summer.

I do not think I need hesitate to mention that K.L.M. had bad luck with the F.20 on its last outward trip from Croydon before the proposed Batavia mail run. I am told that the fact of this machine having to land at Lympe with engine trouble on Saturday is the single case of landing *en route* between England and Holland during 1933. There is no shadow of doubt that the F.20 could have continued the flight on two engines. That goes without saying in these days, but Mr. Smirnoff very soundly decided to turn back and make for the nearest port. The daily Press, despite a clear explanation that this was not a "forced landing," insisted on using that phrase, and added—almost on a note of regret perhaps—that the machine was undamaged and nobody was hurt. Which is not to be wondered at considering there was no *force majeure* about it, but a deliberate choice of an alternative aerodrome as a safety precaution.

I am told that the eager way a certain news agency rang up and attempted to put words into the K.L.M. manager's mouth, convinced him that what was wanted was a crash story, failing which nothing would serve but "forced down" and expressions of that sort. A modern three- or four-engined aeroplane with one engine out of action is rather like a dog on three legs. It is perfectly capable of continuing far and fast, but, like the wise dog, it will select some convenient spot, as a rule, to sit down and give the sore place a lick.

A. VIATOR.

FROM HESTON

TWO pilots who tottered in to tea on Sunday gave hair-raising accounts of their separate meetings with an aerial apparition in the murk above Harrow. Mrs. Alan Butler, carrying Miss Audrey Sale-Barker as a passenger, was flying towards Heston from Stag Lane when she had to turn sharply to avoid a contraption resembling a box-kite—said to be as big as a small aeroplane—which loomed up directly in her path, several hundred feet above the ground. At first Mrs. Butler's story was placed in the Anglers' Achievements category and politely disbelieved until the appearance of Mr. Guy Robson, who gave a corroborative account of a surprise meeting with the mooring cables, which he narrowly avoided, some 300 ft. below the hovering brute.

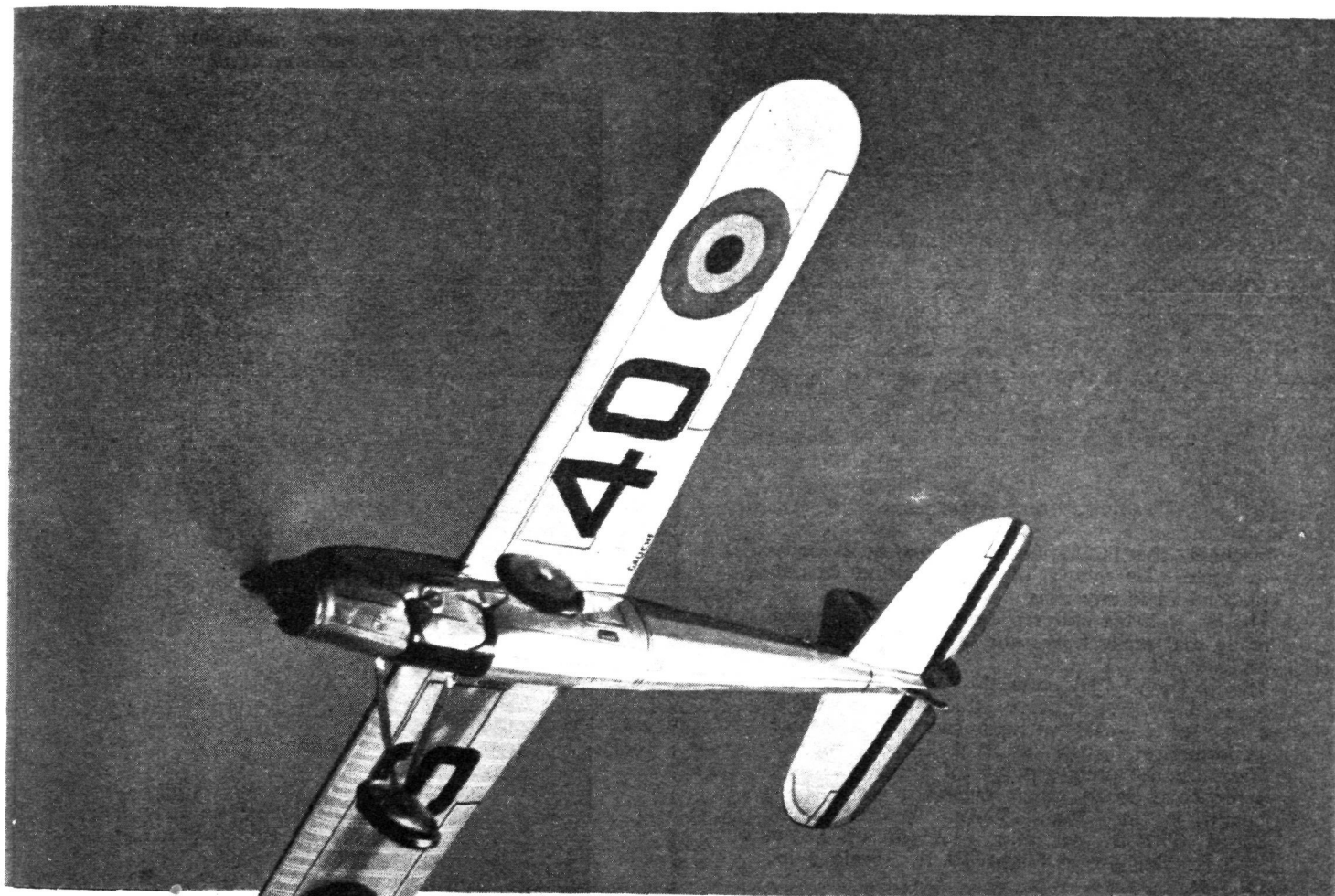
November flying hours are 154 per cent. up on the same month of 1932, and the steady increase over last year's flying time which was maintained throughout the summer, with a "peak" figure of 92 per cent. in the month of July, has developed out of all proportion during the first two "winter" months, October and November.

Two recent recruits to the Airwork School of Flying are Mr. A. N. T. Rankin and his wife, Lady Jean Rankin, a daughter of Lord Stair, who was a capable journalist before her marriage. Mr. Rankin is a first-class naturalist and bird photographer, who has spent many weeks watching birds in the Western Isles. He is now attached to the staff of *The Field*.

Flt. Lt. Christopher Clarkson piloted a "Dragon"-load of Heston *habitués* to a successful shooting party in France during the week-end. They were Miss Rosalind Norman (who has just started a company for making model cars and aeroplanes), Miss Mary Jackaman, Mr. Lewin Barringer and Mr. Niven. The party left Heston on Saturday morning, and were entertained to lunch at Lille by the Club d'Avions Legeres des Flandres. M. and Mme. André Huet officiated as host and hostess, he in his capacity of President of the Club, and among those present were M. Pierre Vanlaer and M. Detroyat. Later the party flew to Berck and motored 25 miles to the shooting box of M. and Mme. Huet. After a Sunday's shooting, they left on Monday at 6 a.m. and arrived at Heston in time for breakfast.

The Airwork Service Department are carrying out three simultaneous radio installation jobs on large aircraft. Two of the machines are trimotor Fords, one the property of Mr. A. E. Guinness and the other B.A.N.C.O.'s latest purchase, while the third is an Airwork "Dragon" which is leaving for Egypt in a few days with Mr. R. O. I. Muntz, a brother of the managing director of Airwork, Ltd., who is being loaned to the associated company, Misr-Airwork.

Mr. J. A. Mollison landed at Heston at 12.15 on Friday, December 1, and went on by car to London. He arrived at Plymouth by sea, and flew on to Heston in a "Dragon" belonging to Hillman's Airways.



A WORLD'S RECORD PERFORMANCE

No other machine in the world, either passenger or single-seater, combines the performance and practical advantages of this interceptor fighter, an I.M.A. production, embodying years of specialised experience, which has so rapidly attained success that it already carries the service colours of seven nationalities.

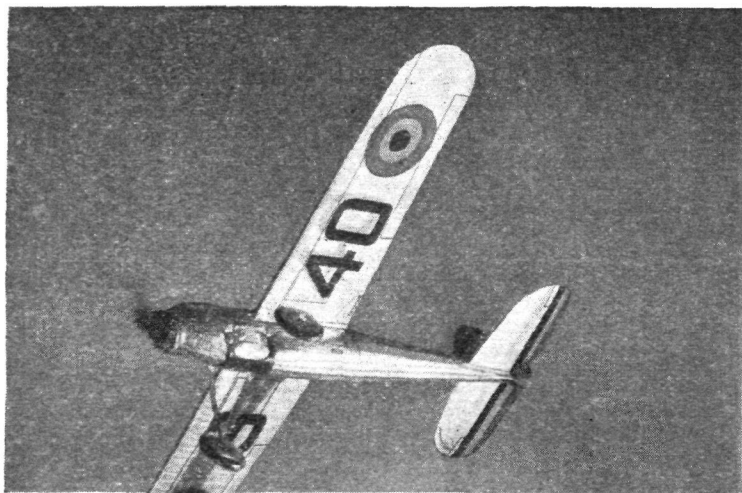
With its aluminium alloy fuselage construction, clean undercarriage and compact design—due to the geared propeller and consequent high ground clearance, it is one of the 'cleanest' machines in the world.

The cantilever wings are of unique design, combining the advantages of wood and metal construction with those of a new surfacing material which develops its full strength. This

(Continued on page xxx)

INTERNATIONAL

Save time by using the Air Mail.



(Continued from page xxix)

machine, the FROG model aeroplane, is really to scale, the photo of the machine is not touched up in any way.

The FROG is the only representative scale model made that really flies right off the ground in a rapid climb.

The propeller is correctly speeded up by accurately-cut gearing, so that the airscrew is correctly to scale without sacrificing correct performance: (scale speed of 236.36 m.p.h.) Here are the unique points of the FROG, not approached by any other machine:—

Length 9½ in. Span 11¼ in. Normal Flying Speed 650 ft. per min. Length of Flight 300 ft. Height of Flight 70 ft. Scale ⅜ in. to 1 ft.

CRASH PROOFNESS.—No machine, large or small, can withstand every form of abuse but the FROG stands a wonderful amount, owing to its special design. The main planes and undercarriage, for instance, are so attached that on encountering any substantial obstruction they detach instead of breaking.

EVERY ONE TESTED.—Each model has to 'take off' with a short run, climbing to clear a set obstruction before it is passed.

NO TEDIOUS WINDING.—One of the many patented features is the special geared-up winding device built into the FROG's box by which it can be wound for flight in 15 seconds.

VARIOUS NATIONALITIES.—The FROG interceptor fighter is made with the correct colours and markings for Britain, U.S.A., France, Italy, Belgium, Holland, Argentina.

AEROBATICS.—Loops and other stunts are easily arranged.

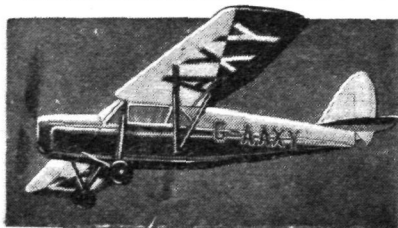
Including box with geared-up winder, winding handle, motor lubricant and fixture, gearing lubricant and full instructions, the

FROG costs 7/6

Obtainable at all Sports and Toy Shops. In case of difficulty write to Sole Concessionaires:

LINES BROS. LTD TRIANG WORKS, MORDEN ROAD, MERTON, S.W.19

British made by International Model Aircraft Ltd.

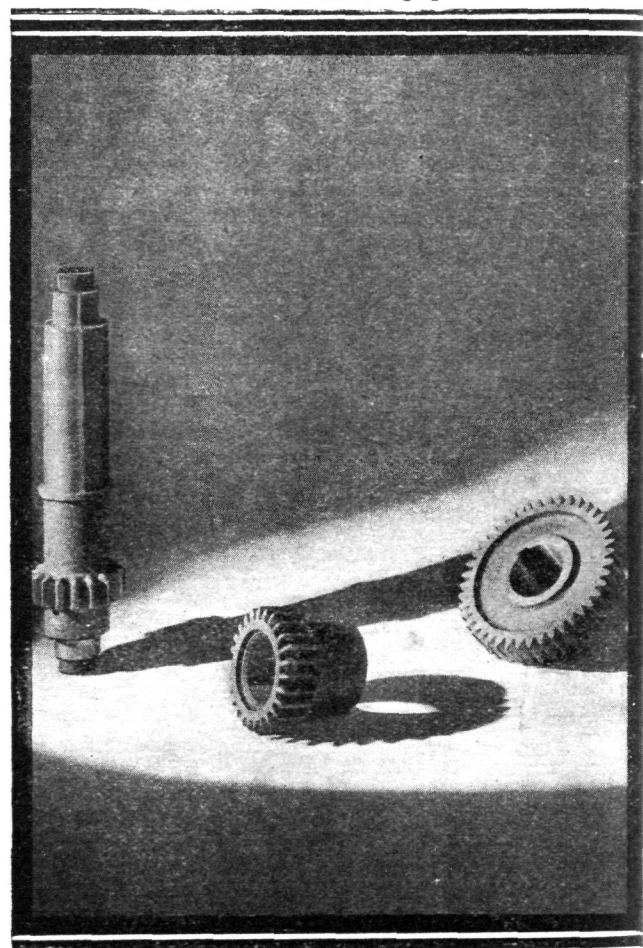


PUSS MOTH

de Havilland 80A.

Span 18'2 in. Length 13'1 in.
Height 4'12 in. Wing area 50'02 sq in. Power weight ratio 6'2:1.
Maximum speed 880 ft. per min. Ceiling 100 ft. Range 600 ft. **17/6**

Fast passenger vehicle parts made from "Hicore 90"—courtesy of The Associated Equipment Co., Ltd.



'STOCKSBRIDGE' ALLOY STEELS

FOR HIGHLY STRESSED PARTS

Here are two of them:—

"HICORE 90"—a new alloy case-hardening steel with a core strength of 90 tons per square inch, permitting a thinner, well-supported case which will not chip.

"TORMOL"—an air- or oil-hardening steel for large or small parts—free from "temper brittleness," with a high impact value.

Write for descriptive booklets of these and other "Stocksbridge" Steels. All alloy and special steels to BESA and other specifications are included in the "Stocksbridge" series.

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Correspondence

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

THE KADENACY CYCLE

[2901] With reference to your comment in FLIGHT for November 23 on "Developing the Kadenacy."

I would like to point out that this principle was applied to an internal-combustion gas turbine well over a quarter of a century ago.

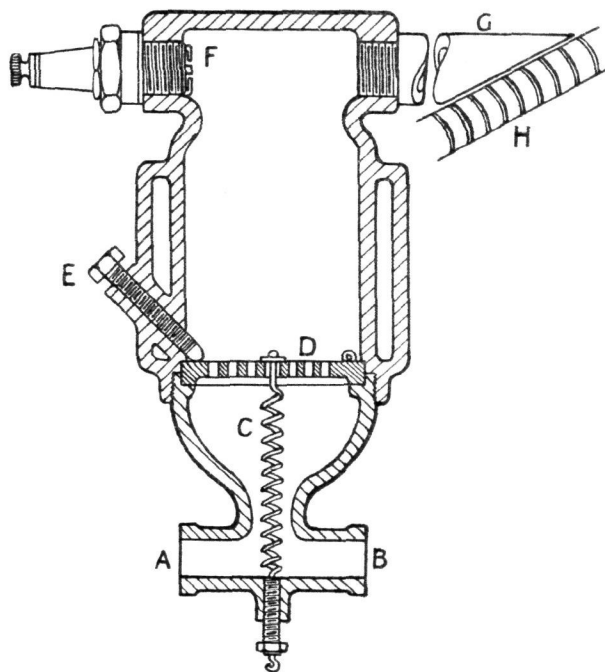
I herewith enclose a diagram and a few details of this prime mover, which was designed and constructed by M. Karavodine, of Paris, in 1908.

This diagram is of the combustion chamber. A and B are the fuel and air inlets respectively; C is a light spring, to hold the valve on its seating. E is an adjusting screw for regulating lift of valve; F is the sparking plug, and G the nozzle through which the effluent gases escaped to impinge on the turbine wheel T.

The volume of the combustion chamber was about 200 c.c. and the turbine wheel was of the de Laval type of about 6 in. diameter; around the circumference of this wheel were placed four of the above-described combustion chambers. The machine developed about 2 h.p. and consumed 5 lb. of petrol per horse-power hr. The overall efficiency works out at about 3 per cent.

The operation is as follows: a charge is ignited by means of the sparking plug in the chamber, the expanding gases cause a sudden rise in pressure and rush out through the nozzle on to the turbine wheel. This outflow of gases produces a momentary partial vacuum in the chamber sufficient to lift the valve and suck in a fresh charge, thus completing the cycle. About 40 explosions occurred per sec. and the maximum pressure obtained was 5 lb. above atmospheric, and the maximum sub-pressure 2 lb. below.

I do not wish to discuss the details of the machine, or the relative efficiencies or otherwise of the cycle, suffice it to say that there are several methods of improving the efficiency of them, and it appears to me that Kadenacy



has adopted the method of compressing the charge before firing, otherwise the principle is the same, and to all intents and purposes the method of charging is surely due to M. Karavodine and not Kadenacy.

London, N.W.6.

W. J. NEWMAN.

November 25, 1933.



D.H. ANNUAL DINNER

THE annual dinner of the de Havilland Aircraft Co. was held on Saturday, December 2, at the First Avenue Hotel, Holborn, Mr. A. S. Butler being in the Chair. The souvenir programme, besides containing the menu of the dinner, provided something else as palatable, if not more so—a list of notable flights done on D.H. products from the year 1925 up to the present time. It made imposing reading, and must have added to the enjoyment of many people's dinners. Incidentally, the quotation on the programme's front page is interesting, for D.H.s. have been largely instrumental in both proving and disproving it. "It will be as common for a man hereafter to call for his wings when about to make a journey as it is now to call for his boots and spurs" (John Wilkins, 1614-1642). Quite! but the class of person who called for his boots and spurs in the days of John Wilkins is hardly comparable with the classes, note the plural, of the present day for whom flying is possible. D.H.s. have been largely responsible for the fact that flying is within the reach of a larger proportion of the nation's community than that which, in the early 17th century, was in the habit of calling for boots and spurs.

At the end of the dinner, and after the Loyal toast, proposed by the Chairman, had been duly honoured, Mr. J. Gow proposed the toast of the Directors and Management. He compared the output of the works with the Biblical loaves and small fishes, mentioned the happy relationship which existed between the works and staff, and said that in drinking this health they must not forget the officials working in D.H. works abroad. Mr. A. S. Butler, in replying, said that the last twelve months showed a vast improvement on the two previous years. At the present time, over 1,200 persons were employed, and the average throughout the year had been over 1,000. The principal event of the year was the production of the "Dragon," which not only had a great future, but already had a great past; it had made it possible for unsubsidised airways to be commercial propositions. The "Leopard" Moth had introduced itself by winning the King's Cup, and sales for this machine were booked up until the end of March. The "Tiger" Moth was selling well, and repeat orders had been received from Denmark,

Persia, Portugal, and Spain. Here, Mr. Butler mentioned that although it was the design and finish which were responsible for the initial sale, it was the workmanship put into the production which was responsible for repeat orders. Turning to engines, the works were forging ahead with the production of the "Gipsy Major" in particular, they claimed that this engine was unequalled for efficiency and in price. The Zenith Cup had been won with a "Gipsy" engine for the fifth time in succession. The King's Cup had been won by a "Gipsy" engine. "Gipsy" engines had been responsible for the success of Mr. Mollison's flights across the South and North Atlantic, and the fact that he failed to get his machine off the ground with twice its practicable permissible load, was in no way due to any failure on the part of his engines. The Chairman then read out cablegrams from D.H. works and agencies in India, Canada, Australia, and South Africa. The message from the latter place finished up with the entreaty "Don't stop research till machine produced which will enable us to attend annually your dinner." Turning to the domestic side, Mr. Butler mentioned the various schemes put forward by the management for the benefit of the employees; these had received increasing support during the year. The move from Stag Lane had been made a necessity by the continued housing developments round that aerodrome, which made taking machines off and landing them too dangerous; also complaints had been received from local residents in increasing numbers. They were glad to have the London Aeroplane Club with them at their new aerodrome at Hatfield. Work was to be started immediately on the new factory, though the engine shops were to remain at Stag Lane for the present; it was, however, the intention of the management to move everything to Hatfield ultimately. As regards the housing of the works personnel, the management would do everything in their power to minimise the dislocation caused by the move. Finally, Mr. Butler, on behalf of the management, thanked the entire staff of the company for their efforts which had enabled the company successfully to weather the last two years' storm of depression. Mr. C. C. Walker then proposed the health of the works and staff; he expressed the opinion that the building of aircraft possessed all the elements of adventure, and emphasised the wonderful spirit of co-operation which existed in the D.H. works. Mr. J. Goby, in replying, stressed the necessity of psychological study that cordial relations might be maintained. "Although you may build 'Dragons,' you can never make saints of all your 'Georges,' he concluded. Mr. W. E. Nixon then proposed the toast of the guests, to which the Hon. Brian E. Lewis replied.

Thereafter the company was entertained by a variety of entertainers, who did various things in various manners on various instruments. Among the guests were the Hon. Brian Lewis, Miss A. Young, Comm. Perrin, Majors F. B. Halford, W. B. N. Roderick, Capt. A. G. Lamplugh, T. P. Mills, Weber, Messrs. J. Brodie, F. Boxall, J. Dorney, C. H. Grace, L. Hill, J. Norman, A. S. Rawlins, A. G. Stedman, W. T. Walker, and H. L. Young.

Book Reviews

First Over Everest. By Air Commodore P. F. M. Fel-lows, D.S.O., L. V. Stewart Blacker, O.B.E., Col. P. T. Etherton, and Squadron Leader the Marquess of Douglas and Clydesdale, M.P. With a Foreword by John Buchan, C.H., M.P., and an account of the filming of the flight by Geoffrey Barkas. (John Lane, the Bodley Head.) Obtainable from FLIGHT Office. Price 12s. 9d., post free.

THE attempts to conquer Mount Everest have captured the imagination of the post-war generation. Man has been to the North Pole and to the South Pole, but as yet no man has set foot on the highest point of the earth. The attempts of the climbers have been gallant in the extreme, and we feel proud that these brave men have all been British.

But, though no man has yet set foot on the summit of Everest, man has looked down on that summit from above, and the men who did so were also British. The public, not only in Great Britain, but throughout the world, will certainly want to learn all the details about the flight which triumphed with such apparent ease over the great peak.

The men who achieved this great triumph have been wise to publish their book about the flight without delay, while the interest is still lively. It will certainly be widely read, and it will also be very much enjoyed. We have no hesitation in recommending it, though it behoves the conscientious reviewer to point out that the book might have been a good deal better than it is. In the first place there are four authors, and it may be taken as a general rule that that is three too many. In the second place, not one of the four is really an accomplished writer, though each of them has merits of his own. Thirdly, there was bound to be some overlapping, though on the whole there is not so much as might have been expected. Fourthly, the authors found that there was not quite enough material to fill a book of some 250 pages without a certain amount of padding. We realise their difficulties, and sympathise with them, but we cannot get away from the belief that the book would have been much better if there had only been one author. Everyone in the party was an expert at his own job, and we feel sure that no one attempted to do anyone else's job. Each cobbler stuck to his last. The expert on organisation, on photography, on airmanship, on oxygen, or on any other of the multitudinous elements which went to make up success, became an amateur when he took the pen in his hand. There was in the party one expert and accomplished writer, the special correspondent of *The Times*, but his name does not appear among the authors. It was apparently the only occasion in the whole of the expedition on which the work of amateurs was preferred to the work of experts.

There is no means of telling which of the authors wrote each section of the book, though occasional passages are credited to one or another. The section on the preliminary stages in technical planning of aircraft, oxygen, photography, etc., is as good as any part of the book. It will open the eyes of the reader to the number and difficulties of the problems which had to be tackled. Probably most people think that you just take an aeroplane out to India, fly over Everest, and there you are! This section shows that the matter was a good deal more complex than that. It is interesting to read, for instance, "that only one engine in the world was capable of doing the work we contemplated, a British engine and a 'Pegasus.'" Though this writer occasionally splits an infinitive or suchlike, he has the great merit of making the technical problems clear and interesting even to the untechnical reader.

A very different writer is he who describes the flight of the three "Moths" out to India. He attempts to be flowery, and does not do it very well. Flights of this nature have often been described before, and sometimes

better described. This section we put down as part of the padding. Much the same may be said of the little essay on India which occurs later on.

The book, of course, must stand or fall by the chapters which describe the two actual flights over Everest, and by the photographs which are reproduced. Wisely, the actual descriptions of the flight have been entrusted, avowedly, to "Blacker of the Guides," who was the observer and photographer on both flights in the "Houston-Westland" piloted by Lord Clydesdale. He had a tremendously difficult task in describing these flights. He and his companions gazed on stupendous scenery which had never before been seen by human eye, and all the time he was working feverishly to take as many photographs and films as he could possibly contrive to do. His cockpit was entirely enclosed at the start of each flight, and to get his pictures he had sometimes to open the overhead cover and then open the trap in the bottom of the fuselage. All the time he had to be careful not to disturb the multitude of electric wires which ran all round his cockpit, some providing heat to his own clothing, and despite the supply of oxygen every movement was a tiring exertion. There can be very few writers anywhere who could really convey in words an adequate idea of the greatest mountain scenery in the world, then seen for the first time from above, and we must cordially admit that Maj. Blacker has done very well in this extraordinarily difficult task.

There are 57 illustrations in the book, photographs, diagrams, and maps. Some of the views of the mountains are very imposing. Such photographs gain immensely by enlargement, and an ordinary book has limitations in that respect. Still, this book gives a fine selection.

The book is not concerned with the scientific results of the flights, but all through it is insisted that the object of the expedition was to add to human knowledge, not to indulge in risky and profitless adventure. It was the scientific objects which enlisted the sympathy of the Government of Nepal, without whose co-operation nothing could have been done. These considerations, and probably the patriotic side as well, influenced Lady Houston to finance the expedition and so add to the debt which British aeronautics already owed her.

"Conquering the Air." By Archibald Williams. (Thomas Nelson & Sons.) Obtainable from FLIGHT Office. Price 4s., post free.

"CONQUERING the Air" as a title for a book is only excusable in that the present participle of the verb is used, and, as the present participle implies a definite hope of accomplishment, even that title is, perhaps, slightly optimistic. Whether it is possible for mortal man to conquer the air depends on the individual interpretation of the word "Conquer." That amazing strides have been made in aviation since man first decided seriously to investigate the possibilities of aerial transit, is obvious to all who study the question. Yet the contrast between the machines of to-day and the early efforts is not fully realised, for the present generation knows little of the early pioneers, and herein lies the chief virtue of Mr. Williams' book.

"Conquering the Air" is a collection of incidental stories of individual flights made since the year 1783, in all kinds of machines, both heavier and lighter than air. The earlier flights are dealt with at some length and make very interesting reading, especially the stories of the first lighter-than-air ascents. Thereafter the writer has picked out what he considers to be epoch-making flights, and has described them in some detail. Incidentally, it is interesting to note that Mr. Williams describes at length the first attempt to cross the Atlantic by air, which took place only a little over a year after Bleriot's first crossing of the English Channel.

Noses Red, Noses Blue

ENGINES used for miscellaneous experimental and test purposes are to have their noses painted red according to an order of the American Bureau of Aeronautics, in order that they may be distinguished from those normally used

in Service aircraft. It is intended that this red nose will intimate to the personnel, that they should acquaint themselves with its characteristics and history before using that engine. This seems a grand scheme which might well be extended to other spheres.

THE ROYAL AIR FORCE

London Gazette, November 28, 1933

General Duties Branch

P/O. R. G. S. Morgan-Smith is promoted to rank of Flying Officer (April 10); P/O. W. H. E. Tew is transferred to Reserve, Class A (Nov. 25); the short service commn. of Acting Pilot Officer on probation D. G. S. Cotter is terminated on cessation of duty (Nov. 29).

Chaplains Branch

The Rev. C. D. Fay is granted a short service commn. as Chaplain (Roman Catholic) with the relative rank of Sqdn. Ldr. (Nov. 9).

Errata

Gazette of Oct. 3, FLIGHT, Oct. 12, 1933, p. 1037, for John Gyll Murray read John Edwin Campbell Gascoigne Flemyng Gyll-Murray; for William Anthony Igoo read William Anthony Kevin Igoo.

ROYAL AIR FORCE RESERVE RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The follg. Flying Officers are transferred from class A to class C: R. Hood (Oct. 24); B. A. Davy (Oct. 30); L. C. L. Murray (Nov. 11). F/O. R. Hall is transferred from class C to class B (Oct. 24).

SPECIAL RESERVE

General Duties Branch

J. A. C. Warren is granted a commn. as Pilot Officer on probation (Nov. 29).

AUXILIARY AIR FORCE

General Duties Branch

No. 601 (COUNTY OF LONDON) (BOMBER) SQUADRON.—F/O. I. A. Murray relinquishes his commn. on completion of service (July 17).

AUXILIARY AIR FORCE RESERVE OF OFFICERS

General Duties Branch

I. A. Murray is granted a commn. as Flying Officer in class A (Nov. 9).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commanders: E. Osmond, C.B.E., to H.Q., Fighting Area, Uxbridge, 20.11.33, for duty as Sen. Equipment Staff Officer, *vice* Wing. Com. W. H. Dolphin. A. A. B. Thomson, M.C., A.F.C., to No. 7 (B.) Sqdn., Worthy Down, 1.11.33, to Command, *vice* Wing-Com. A. L. Gregory, M.B.E., M.C.

Squadron Leaders: C. Bounphrey, D.F.C., to No. 1 School of Tech. Training (Apprentices), Halton, 17.11.33, for Administrative Duties in No. 2 Apprentices Wing, *vice* Sqdn. Ldr. W. S. Caster, M.C. C. S. Richardson, M.B.E., to No. 9 (B.) Sqdn., Boscombe Down, 20.11.33, for flying duties, *vice* Sqdn. Ldr. W. M. Yool. F. C. B. Savile to R.A.F. Base, Calshot, 15.11.33, for Flying Duties, *vice* Sqdn. Ldr. L. G. Maxton, A.F.C.

Flight Lieutenants: L. de V. Chisman to Air Armament School, Eastchurch, 26.10.33. M. C. Dick, A.F.C., to Air Armament School, Eastchurch, 12.11.33. E. C. Dearth to R.A.F. College, Cranwell, 17.11.33. A. D. Gillmore to Air Pilotage School, Andover, 13.11.33. H. S. Sandiford to No. 1 Armoured Car Co., Hinaidi, 17.11.33. A. T. K. Shipwright, D.F.C., to No. 1 Armoured Car Co., Hinaidi, 17.11.33.

Flying Officers: G. S. Barrett to R.A.F. Base, Gosport, 15.11.33. C. E. St. J. Beamish to Air Armament School, Eastchurch, 24.10.33. C. M. Champion de Crespigny to Air Armament School, Eastchurch, 29.10.33. F. B. H. Hayward to Air Armament School, Eastchurch, 6.11.33. R. T. S. Morris to Air Armament School, Eastchurch, 30.10.33. L. E. B. Stonhill to Air Armament School, Eastchurch, 17.11.33. W. L. Houlbrook to No. 1 Armoured Car Co., Hinaidi, 17.11.33. A. V. Bax, A.F.M., to No. 5 Flying Training School, Sealand, 18.11.33. L. W. C. Bower to Station Flight, Duxford, 18.11.33. W. I. H. Burke, to No. 5 Flying Training School, Sealand, 18.11.33. P. F. Canning to No. 58 (B.) Sqdn., Worthy Down, 18.11.33. H. F. Chester to No. 3 Flying Training School, Grantham,

18.11.33. R. T. P. Clarkson to R.A.F. Base, Gosport, 18.11.33. D. J. Douthwaite to R.A.F. College, Cranwell, 18.11.33. F. R. Drew to No. 3 Flying Training School, Grantham, 18.11.33. G. K. Fairclough to Station Flight, Abingdon, 18.11.33. P. Heath to R.A.F. College, Cranwell, 18.11.33. J. Heber Percy to No. 3 Flying Training School, Grantham, 18.11.33. H. R. L. Hood to R.A.F. Training Base, Leuchars, 18.11.33. R. V. McIntyre to R.A.F. College, Cranwell, 18.11.33. W. N. McKechnie to No. 5 Flying Training School, Sealand, 18.11.33. R. C. Mead to Station Flight, Abingdon, 18.11.33. W. V. L. Spendlove to No. 5 Flying Training School, Sealand, 18.11.33. F. W. Stannard to No. 608 (N. Riding) (B.) Sqdn., Thornaby, 18.11.33. J. S. Tanner to R.A.F. College, Cranwell, 18.11.33. J. B. Tatnall to No. 3 Flying Training School, Grantham, 18.11.33. R. E. de T. Vintras to No. 5 Flying Training School, Sealand, 18.11.33. R. L. Wallace to R.A.F. College, Cranwell, 18.11.33. G. Burdick to No. 19 (F.) Sqdn., Duxford, 17.11.33. L. R. S. Freestone to Air Armament School, Eastchurch, 29.10.33. D. W. Lucke to No. 500 (County of Kent) (B.) Sqdn., Manston, 20.11.33. A. N. Luxmoore to Air Armament School, Eastchurch, 30.10.33. G. P. Marvin to Air Armament School, Eastchurch, 16.10.33. A. W. S. Matheson to R.A.F. Base, Gosport, 20.11.33. P. H. Maxwell to Air Armament School, Eastchurch, 20.10.33.

Pilot Officer: R. L. Bradford to No. 1 Armoured Car Co., Hinaidi, 17.11.33.

Medical Branch

Squadron Leader: L. P. McCullagh to Station H.Q., Bircham Newton, 24.11.33, for duty as Medical Officer.

Chaplains Branch

Rev. C. D. Fay to R.A.F. Depot, Middle East, Aboukir, 9.11.33, for duty as Chaplain (R.C.) on appointment to a Short Service Commn.

The Air Force List

THE December issue of the Air Force List has now been published. It can be purchased (price 2s. 6d.) from H.M. Stationery Office at the following addresses:—Adastral House, Kingsway, London, W.C.2; 120, George Street, Edinburgh; 2, York Street, Manchester; 1, St. Andrew's Crescent, Cardiff; 15, Donegal Square, Belfast; or through any bookseller.

Comrades of the Royal Air Forces

THE Lord Trenchard, President of the Comrades of the Royal Air Forces, presided at the annual dinner of the Association at the Thames House Restaurant, Millbank, on November 25, 1933. Nearly 400 members, representative of all ranks, were present. Lord Trenchard congratulated the

organisation on its vitality and progress. Other speakers included Air Chief Marshal Sir Edward L. Ellington, Chief of the Air Staff; Air Vice-Marshal F. W. Bowhill, Air Member of Council for Personnel; and Air Commodore B. C. H. Drew, Chairman of the Association.

R.A.F. Medical and Dental Services Dinner

THE twelfth annual dinner of the Royal Air Force Medical and Dental Services will be held at the Royal Air Force Club at 7.30 p.m. for 8 p.m. on Friday, December 15, 1933.

Tickets, 10s. 6d. each, exclusive of wines, may be obtained from the Honorary Secretary, Sqdn. Ldr. R. Boog-Watson, Directorate of Medical Services, Air Ministry, 5-6, Clement's Inn, W.C.2.

The sign of the dove

ACCORDING to a report, all civilian German airmen will in future wear a uniform designed by Gen. Goering, the Reich Commissioner for Aviation.

Variable pitch airscrews

AT last European aircraft operators are investigating the claims which have been advanced for variable pitch airscrews. The Ratier Company is experimenting with several new types. Their "945" type is adjustable in flight by means of an electric servo motor. Air France has ordered three Smith v.p. airscrews for experimental purposes, and Deutsche Luft Hansa is testing the "Savoia" type. This latter airscrew has been tested by Deutsche Versuchsanstalt für Luftfahrt, at powers twice as great as those of the engines for which it designed. The Vereinigte Deutsche Metallwerke, of Heddernheim, is also investigating the problems of variable pitch airscrews.

Health of the R.A.F.

THE report on the health of the Royal Air Force for the year 1932 has just been published. From the figures recorded it is clear that as regard to health the R.A.F. have had a record year. The average strength of the total force during 1932 was 31,877 and the total number of cases of sickness (inclusive of admissions to hospitals and sick quarters and cases of less than 48 hours' duration) was

20,159, which gives a case incidence of 632.4 per 1,000 of strength. The case incidence for the year 1931 was 681.2 per 1,000 of strength. The total number of admissions to hospitals and sick quarters during the year 1932 was 12,710, representing an incidence of 398.7 per 1,000. This incidence rate for 1932 shows a reduction of 34.5 per 1,000 of the strength for the year 1931. There were 115 deaths in the R.A.F. during the year under survey, compared with 143 deaths recorded for the previous year. Of the 115 deaths, 49 occurred to officers, 5 to aircraft apprentices and 61 to other airmen. 32 officers lost their lives through flying accidents, two not on duty, and 17 airmen lost their lives through flying accidents. In the Reserve, 130 candidates were examined at the Central Medical Establishment out of which number 95 were accepted as medically fit.

Scientific and industrial research

MR. BALDWIN stated in the House of Commons on November 28 that the cost of work carried out by the Department of Scientific Research on behalf of the War Office, Admiralty and Air Ministry for the last three years was, to March 31, 1931, £38,734; 1932, £39,174, and 1933, £39,793. These sums were recovered from the departments concerned, and 80 per cent. had been recovered from the Air Ministry.

AIR POST STAMPS

By
DOUGLAS ARMSTRONG
(Editor of "Stamp Collecting")

French Guiana Redivivus

One of the first countries to indulge in aero stamps, albeit of a semi-official character only, the colony of French Guiana has now blossomed forth with a regular government issue embracing seven denominations in a highly picturesque design showing an aerial view of Cayenne, the capital, flanked by tropical foliage and surmounted by a drawing of a biplane with the words "Poste-Aerienne" disposed on either side.

Effectively reproduced by the helio-gravure process in the atelier Vaugirard, Paris, they comprise 50 centimes red-brown, 1 franc green, 1.50 fr. blue, 2 fr. orange, 3 fr. black, 5 fr. violet, 10 fr. olive, 20 fr. red.

Retrospect

The earlier air post stamps of French Guiana, it may be recalled, were rather crude productions made on behalf of a private concern holding the government contract for the conveyance of mail by air between Cayenne and the gold-fields of St. Laurent, in the interior. The service was suspended after a very short life and several of its stamps are exceedingly rare, although at the present time they are less sought after by ardent aero philatelists than they were a few years ago. Now that the country of their origin has rejoined the air stamp issuing ranks, it may be that a revival of interest in these pioneer "vignettes" will follow.

London—Plymouth Air Mail

The first flight between Croydon, Southampton and Plymouth, under the auspices of the West Country Air Service, took place on November 27, all mail carried being franked with the latest semi-official air mail stamp described in this column last month. So great was the demand by collectors for this striking addition to the British air stamps that three printings of approximately 2,500 copies each were actually made prior to the service being put in operation.

Holland—Java Xmas Air Mail

Letters carried on the special through Christmas air mail flight from Amsterdam to Batavia will all bear the new triangular 30 cents stamp, originally prepared for the postponed "Pandar" flight and showing the prow of an aeroplane with the propeller ready for swinging. A supply of stamps in a similar design has been sent out to the Dutch Indies for use on mail despatched by the return flight, which is expected to reach Holland in time for the New Year.

New Greek "Officials"

The second of the much heralded sets of Greek air mail stamps made its *début* on November 2 in the same seven denominations, admirably engraved and printed by the native firm of Asprotis Freres at Corfu, in three striking designs representing aeroplanes flying over a map of Greece itself, the Isle of Greece and the Acropolis respectively. These stamps are reserved for franking correspondence transmitted over air routes other than those operated by the Italian Aero Espresso Company, which holds the government contract for the Brindisi-Athens-Istanbul-Rhodes air service.

Greece is thus the proud possessor of the two most beautiful series of air mail stamps in general use to-day.

Air Mail Week in Nicaragua

In connection with the propaganda for an International Air Mail Week organised in this Central American State from November 3 to 11 last, a limited issue of special stamps was created in a design representing the Winged Wheel of Icarus flying over the sun to the extent of only 2,500 complete sets, locally printed in miniature sheets of four and of the denominations 10 c. bistre, 15 c. violet, 25 c. red, and 50 c. blue.

Soviet "Stratosphere" Stamps

To commemorate the establishment of a new altitude record by Russian aeronauts in September last, three

Provincial Airways. First Flight. PLYMOUTH - LONDON.



AN INTERNAL AIR MAIL: One of the covers carried on the first service between London and Plymouth, operated by Provincial Airways, Ltd.
(Flight Photo.)

special stamps have been placed on sale by the Soviet post office in a design illustrating the ascent of the "Stratostat, U.S.S.R.," with the record height of 19,000 metres inscribed across the top of the tall vertical panel. One hundred thousand copies of the 5 kopeks blue and 10 kopeks red, but 30,000 only of the 20 kopeks violet have been printed as souvenirs of this notable achievement.

Paris—Noumea Flight Commemoration

On December 1 a distinctive overprint commemorating the anniversary of the first air liaison between France and New Caledonia was applied to a limited number of contemporary postage stamps of the latter colony, which were to be sold in complete sets only for a period of fifteen days from that date.

Air Stamps at Auction

Some recent realisations made by air post rarities in London auction rooms include £40 for an unused "Ross Smith" vignette and £25 for a similar item on flown cover, with the special cachet. Colombia No. 1, official air stamp, on flown cover, made £30, and an "Alcock" Trans-Atlantic cover £21, whilst an unflown "Handley-Page" cover fetched £12 10s. A mint copy of the inverted overprint error of the "Halifax" air mail stamp of Newfoundland sold for £48.

NEW COMPANIES REGISTERED

AVIATION DEVELOPMENTS, LTD., 100, Charing Cross Road, W.C.2.—Capital, £4,000 in 2,500 7½ per cent. preference and 500 ordinary shares of £1 each and 20,000 deferred shares of £1 each. Objects, to carry on any business appertaining to aeronautical development and the promoting and development of public interest in aviation in any part of the world, to promote and organise air pageants and displays, etc. Directors: Ronald D. Gerrans, Homelands, Stanstead Road, Bishops Stortford (director of Ensign Lubricants, Ltd.). Sydney N. Gerrans, 10, Royal Crescent, W.11 (director of Ensign Lubricants, Ltd.). Richard L. Howard-Flanders, 8, Central Road, Wembley, aeronautical engineer.

Increase of Capital

BRITISH AIR NAVIGATION CO., LTD., 3-4, Clements' Inn, W.C.2.—The nominal capital has been increased by the addition of £19,500 in £1 ordinary shares beyond the registered capital of £500.

PUBLICATIONS RECEIVED

Report on the Health of the Royal Air Force for the Year 1932. Air Publication 875 (1932). London: H.M. Stationery Office, W.C.2. Price 1s. 6d. net.
Bulletin Technique des Avions H. Potez. No. 18. 1933. Henry Potez, 75, Avenue des Champs Elysees, Paris.

Catalogues

Cellactite Ventilators and Ventilation Data. Cellactite and British Uralite, Ltd., Lincoln House, 296-302, High Holborn, London, W.C.1.
Palmer Aircraft Landing Equipment: Tyres, Wheels, Brakes and Brake Controls. The Palmer Tyre, Ltd., Aldwych House, London, W.C.2.

PATENT AERONAUTICAL SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. (The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1932

Published December 7, 1933

- 4,216. BENDIX AVIATION CORPORATION. Engine-starting mechanism. (401,331.)
- 6,814. P. MOSIMANN. Aeroplane. (401,266.)
- 12,981. F. MICHAUD. Speed-indicator for aerial moving bodies. (401,339.)
- 16,686. H. N. CHILDE. Model aeroplanes. (401,400.)
- 19,228. R. DE VILLAMIL. Screw propellers and screw fans. (401,425.)
- 34,460. G. EYSSARTIER. Devices for ensuring protection from the danger of fire from back-firing in aircraft.

APPLIED FOR IN 1933

Published December 7, 1933

- 13,387. SOC. ITALIANA E. BREDA PER COSTRUZIONI MECCANICHE. Constructional parts for aircraft. (401,598.)

Personals

PREPAID

(18 words or less 3/6, then 2d. per word).

To be Married.

GRIERSON: HELLYER.—The engagement is announced between Mr. JOHN GRIERSON, R.A.F.C., only son of the late Mr. John Grierson and of Mrs. Grierson, and Miss BROWNIE HELLYER, second daughter of Mr. and Mrs. Owen S. Hellyer.

LEA-COX: MILLIGAN.—The engagement is announced between FLYING OFFICER KENNETH LEA-COX, R.A.F., youngest son of Mr. and Mrs. A. H. Lea-Cox, of Pine Ridge, Canford Cliffs, and MAUREEN, only child of Dr. and Mrs. James Milligan, of Hill Brow, Canford Cliffs, Bournemouth.

SAYE: HIME.—The engagement is announced between FLIGHT LIEUT. G. I. L. Saye, A.F.C., R.A.F., only son of Mr. and Mrs. G. N. Saye, of Heathfield, Bramsgore, Hampshire, and PAMELA, younger daughter of Lt.-Col. and Mrs. Ross Hime, of Inver House, Bembridge, Isle of Wight.

Married.

NORTHWAY: IRVING.—On Nov. 19, 1933, at Karachi, FLYING OFFICER EDWARD GEORGE NORTHWAY, M.B.E., R.A.F., eldest son of Mr. and Mrs. Leon Northway, of Perth, W.A., to JANET GILMOUR, youngest daughter of Mr. and Mrs. Edward Irving, of 1, Fairfield Road, Exmouth.

Births.

BUSK.—On December 2, 1933, at 27, Hyde Gardens, Eastbourne, to ENID, wife of SQUADRON LEADER C. W. BUSK, M.C., A.F.C., R.A.F.—a son.

MISCELLANEOUS ADVERTISEMENTS.

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A. P. THURSTON & CO., Chartered Patent Agents, 329, High Holborn, W.C.1. Tel.: Hol. 1117.

F. J. CLEVELAND & CO., Chartered Patent Agents, 29, Southampton Buildings, London, W.C.2. Telephone: Holborn 5875-6.

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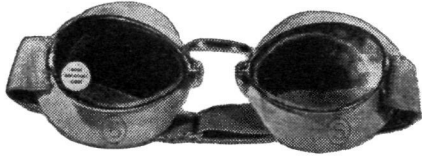
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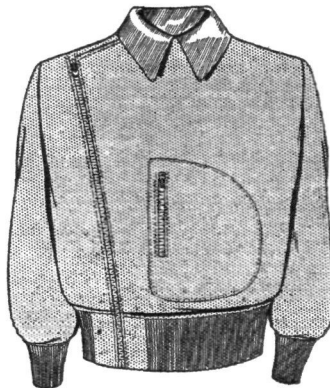
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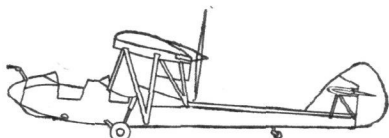
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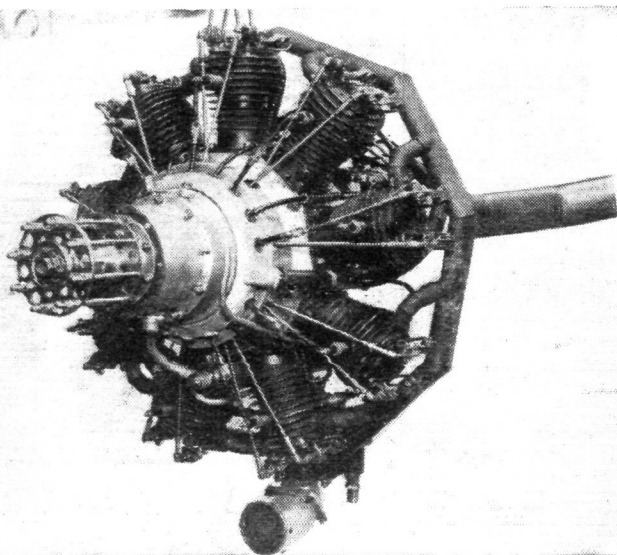
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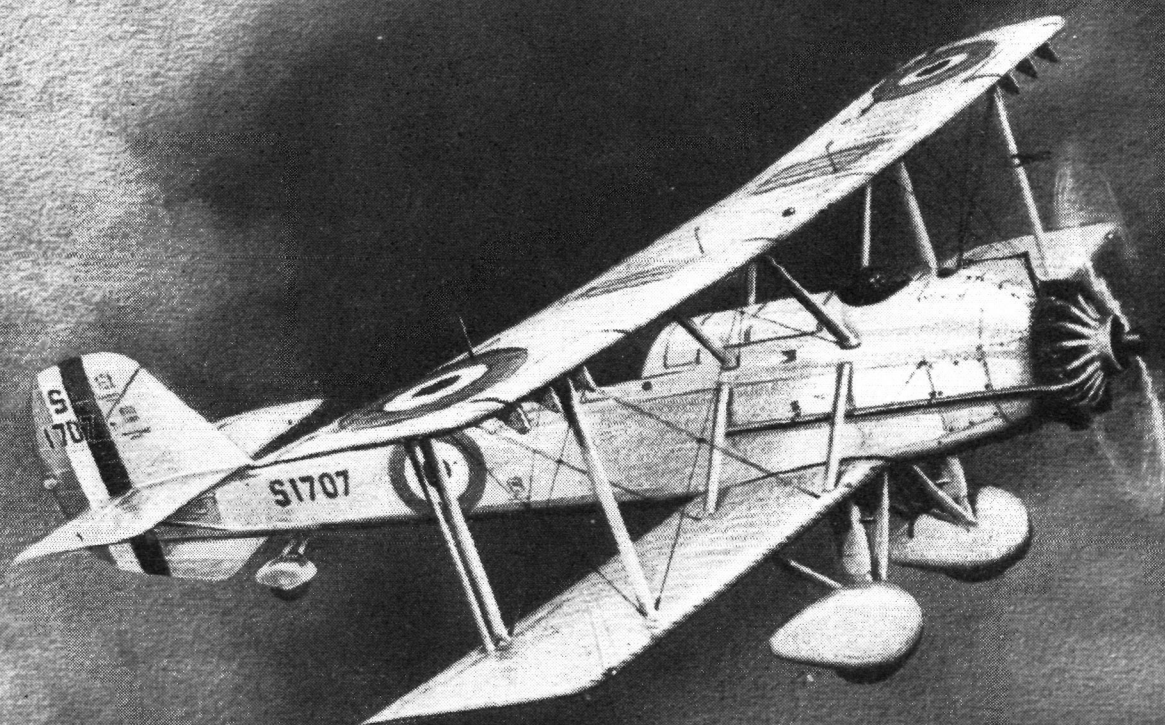
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